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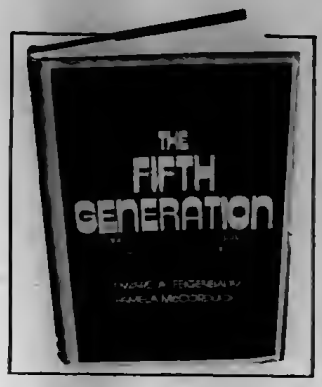

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

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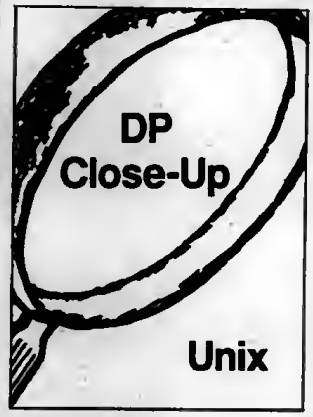

Bell Software Still a Center Of Controversy

It is refreshing to see something designed with such elegance and simplicity.
— Robert Rosenschein, a consultant in Silver Spring, Md.

I think you would be hard pressed to find a programmer who used it who didn't really like it.
—.Sandra I. Heiler of The World Bank's Information Resource Management Department in Washington, D.C.

By Lois Paul
CW Staff

Mention the Unix operating system in the midst of a group of believers and you will receive an assortment of verbal bouquets like the ones above.

About 3,000 such Unix proponents flocked to San Diego in January for the Unicom conference, co-sponsored by Unix/Usr/Group (the commercial users group) and the Software Tools Users Group. Half that number of attendees had gone to the same conference six months earlier.

(Continued on Page 8)

Today's the Day: NCC Opening On West Coast

By Cheryl M. Gelb
CW Staff

ANAHEIM, Calif. — This year's National Computer Conference, opening here this morning, will be a true three-ring circus as more than 635 vendors display their wares in three locations — the Anaheim Convention Center; the center's parking lot, where six temporary buildings have been erected; and in the Disneyland Hotel Convention Center.

The box office for the biggest extravaganza staged annually by the U.S. computer industry — it is expected to draw 130,000 people this year — opens at 7:30 a.m. This year's NCC is notable for several reasons: It is the 10th annual conference in the National Computer Conference's 32-year history (previously, the show was held twice a year); it will offer the biggest exhibit floor yet (more than 320,000

(Continued on Page 6)

Magnuson M80 Tops Datapro '83 Ratings

By Ed Scannell
CW Staff

DELRAN, N.J. — Proving the adage that no one appreciates you until you're gone, mainframes from Magnuson Computer Corp. — the plug-compatible vendor that filed for Chapter 11 bankruptcy protection two months ago — finished first in terms of overall satisfaction today when Datapro Research Corp. released its "1983 User Ratings of Computer Systems."

Machines from Digital Equipment Corp., which came in fourth last year, placed second this year. Like last year, Amdahl Corp.'s systems came in third.

Mainframes from Control Data Corp. finished last, breaking Honeywell, Inc.'s three-year streak in that position.

While only 19 users of Magnuson's M80 series responded to the survey compared, for example, with 126 users of the IBM 360, they awarded their systems consistently high marks in categories such as ease of operation, ease of programming and system reliability. In addition, 95% said they have no plans to replace or upgrade their M80s over the next year.

For the second year in a row, all but one manufacturer of IBM plug-compatible mainframes were rated higher than IBM itself. Besides Magnuson in first place and Amdahl in third place, National Advanced Systems, Inc. came in fourth in user ratings, finishing one notch higher than IBM.

IPL Systems, Inc., the fourth PCM manufacturer whose processors were rated in the survey, came in as No. 6, closely following IBM.

(Continued on Page 76)

Charts With User Ratings of Specific Mainframes: Pages 77 through 79
Next Week: Minicomputer Users Rate Their Machines

NAS Unleashes Three 3083 Rivals

By Jeffry Beeler
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — National Advanced Systems, Inc. last week expanded its IBM-compatible processor line with three IBM 3083-class mainframes that reportedly provide 20% greater price/performance benefits than the industry giant counterparts.

The Advanced System (AS)/8000 series machines were introduced simultaneously with NAS' Model 7380 disk subsystem, which reportedly offers basically the same performance features as the IBM 3380 for a 20% lower price (see story on Page 4).

Comparable in processing power to the low end of NAS' existing top-of-the-line AS/9000 mainframe family, the AS/8000 series consists of the AS/8040, 8050 and 8060.

The bottom-of-the-line AS/8040 provides 10% to 20% more performance than IBM's 3083E for roughly the same price, an NAS spokesman said. The 8050 and 8060, by contrast, reportedly equal the processing power of the 3083B and 3083J, respectively, and cost about 20% less than their IBM equivalents. NAS rates the AS/8050 as 25% to 30% more powerful than the 8040 and 25% to 30% less powerful than the 8060.

Presently, the AS/8000 machines emulate the 3083 family only in the 370 series mode. But by the end of the first quarter of 1984, the NAS processors will be available with an optional Extended Architecture (XA) feature, the spokesman said.

The addition of XA microcode will reportedly allow the AS/8000 to support 31-bit addressing, expand beyond 16 channels and operate concurrently in both the 24- and 31-bit addressing modes.

All three AS/8000 family members support data streaming, MVS/SP Assist and Virtual Machine Assist.

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IBM Tax Change Not a Surprise

By Tom Henkel
CW Staff

RYE, N.Y. — A decision by IBM earlier this month to stop offering investment tax credits to its customers on rented and leased hardware — in effect raising its hardware rental and lease prices — came as no surprise to IBM users and consultants contacted last week.

In fact, at least one consultant observed that IBM may have set a standard for other vendors.

IBM's change in its investment tax credit policy — which goes into effect Jan. 1 — applies to eligible hardware leased directly from IBM on rental and lease agreements, model conversions, IBM's Pilot Test Plan Agreements and the Series/1 Special Test Agreements.

Investment tax credits are incentives offered by the government to encourage companies to use new equipment. The credits can range from 6% to 10% of the purchase price, depending on whether the equipment is depreciated over five or seven years, according to William Easterbrook, an analyst with New York-based Kidder, Peabody & Co.

IBM will offer the tax credits to customers who rent or lease hardware only if they agree to purchase that hardware within six months. Otherwise, the only way users can get tax credits from IBM (aside from an outright purchase) is to enter a term lease through the IBM Credit Corp. or organizations that have distribution agreements with IBM, the industry giant said. The term leases, observers said, are recorded as sales by IBM.

"Users should definitely be concerned; [the change in the investment tax credit policy] is going to affect them somehow," Bill Neiman, a Cincinnati-based consultant on hardware purchasing, noted.

Big companies planning to make large lease and rental agreements with IBM may, through negotiation, be able to get the tax credits back in spite of IBM's official policy. But small and medium-size companies may be out of luck, according to Nieman.

"I'm sure if IBM tries this and gets away with it, it will become an industry standard," Nieman said, adding that in addition to pushing users to purchase hardware, IBM stands to make a fair amount of money by keeping the investment tax credits it now passes along to its customers.

Besides giving users another incentive to purchase hardware, Neiman said the investment tax credit policy could be an early indication that IBM is planning to make some additional large system announcements. If that is so, IBM will want to convert as many leased machines to purchased machines as possible before older machines become obsolete.

But users of IBM systems appear to be unfazed by the policy change, according to John Magee, president of KTTM, Inc. — a New York-based consulting firm. Magee noted that only a few of his clients have expressed concern about the change, and even those clients were not terribly upset. Users are not worried, Magee pointed out, because many third-party leasing firms are still willing to pass along tax credits to their customers; if users cannot find the deal they want from IBM, they simply can go somewhere else.

Another reason for the lack of concern may be that IBM's strategy to push users to buy rather than lease hardware may already have worked. Several users contacted last week said the policy change would have no effect on them because they no longer lease hardware.

Corning Glass Works, for example, usually buys hardware when it can be justified for longer than two years, noted John Parker, director of Corning's Information Services Division.

Likewise, the director of information services at a New Jersey-based chain of retail stores, who asked not to be identified, said his firm recently adopted a policy to purchase hardware whenever possible. Up until about six months ago, the firm had a policy of leasing hardware from IBM and buying it when enough purchase accrual credits had been accumulated.

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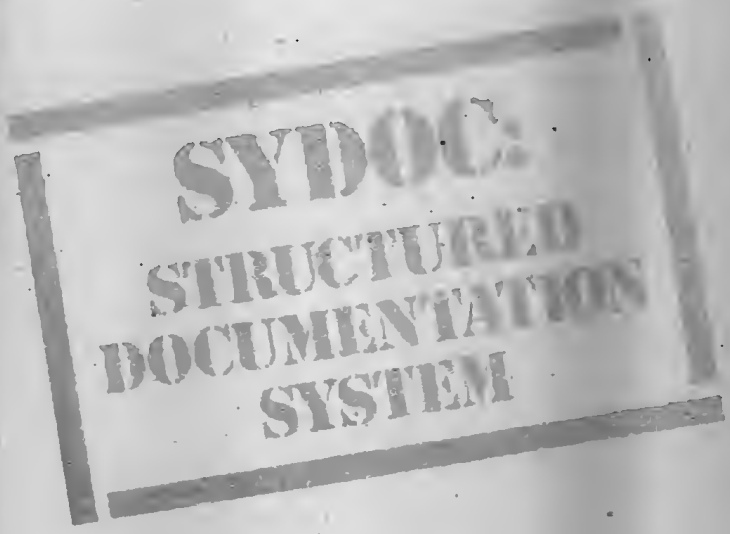

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DP/WP Units Compatible With IBM, Wang Products Put Harris Into OA Ranks

By Bruce Hoard
CW Staff

MELBOURNE, Fla. — Harris Corp. formally broke into the office automation ranks last week when it unveiled a family of integrated word and data processing office systems that are said to be optionally compatibile with products from IBM and Wang Laboratories, Inc.

Systems in the Harris 9000 series range from stand-alone word processing and professional computing workstations to clustered computers that reportedly support multiple work groups.

Large-scale IBM compatibility comes through IBM 2780/3780 and 3270/Systems Network Architecture terminal emulation. The Harris units are capable of exchanging documents with the Wang Office Information System product line through an optional conversion utility, which Harris claimed is the first efficient communications link between IBM and Wang word processors.

The 9000 series will be compatible with the IBM Displaywriter in the near future, a Harris spokesman said.

At the heart of the 9000 series is an architecture of multiple 16-bit Intel Corp. 80186 microprocessors and a just-released multitasking distributed operating system that reportedly has a number of integral network support features.

The 9000 series workstation has a high-resolution, 15-in. display and a detached keyboard. In addition to integrating word processing and communications capabilities, each workstation can serve as a professional computer optionally utilizing the Digital Research, Inc. CP/M 86 or Microsoft, Inc. MS-DOS operating systems and applications software.

The 9000 series products unwrapped last week include:

- The 9010 stand-alone word processor, which can be used as an individual entry-level system or as a remote information processing station capable of communicating with other work groups or centralized sites. It includes a workstation, controller, rigid and floppy disk storage options (up to 16M bytes), a 40- to 55 char./sec letter-quality printer and a memory capacity of 1M byte. Its price is $9,500.
- The 9015 professional computer, which includes the same components as the 9010 but adds CP/M 86 or MS-DOS. It costs $9,300.
- The 9020 minicluster, which supports up to four devices with any mix of printers and workstations. It also supports up to 16M bytes of floppy and rigid disk storage and can have up to 1M byte of main memory. A configurstion with one workstation and one printer costs $16,000. Three workstations and one printer cost $27,250.
- The 9050 cluster, which supports up to 12 devices in any mix of printers and workstations. Up to 100M bytes of floppy and rigid disk storage are available, and each workstation supports up to 1M byte of memory. The system's controller also supports up to 1M byte of memory. Prices begin at $31,500 for one workstation and one printer. A typical configuration that includes eight workstations and four printers is priced at $84,000.
- The 9060 dual cluster, designed to support up to 24 devices in any configuration. Harris said a unique feature is the redundancy offered by the tandem configuration of the 9060's cluster controllers, allowing for virtual nonstop processing. Memory capacity is up to 1M byte per workstation and up to 1M byte per controller. A typical configuration of 16 workstations and eight printers is priced at $168,250.

Harris Corp.'s 9050/9060 Clusters

The Wang conversion utility costs $2,500, while the CP/M 86 and MS-DOS operating systems are priced at $2,500 each.

The 9000 series will be available in November in New York, Washington, D.C., Pittsburgh, Dallas and Los Angeles, Harris said from its Word Processing Division in Melbourne, Fla. 32901.

NAS Unleashes Three Machines to Rival 3083

(Continued from Page 1)

the spokesman said. Only the 8050 and 8060, however, accommodate XA.

When equipped to run in the 370 XA mode, the AS/8000 will be able to support MVS/SP Version 2 and its accompanying program products, including the MVS/XA and VM/XA Migration Aids, the spokesman said. In the standard 370 mode, by contrast, the processors already support MVS/SP Version 1.3 and VM/SP.

The new processors incorporate the same chip and circuit technology as the firm's existing AS/6600- and AS/9000 series systems, which reportedly allows the systems to occupy half as much floor space as similarly configured IBM 3083s.

Though intended primarily as a replacement for the 3083, the AS/8000 is also aimed at users of multiple IBM 4341s, the source added. Many of those users reportedly are contemplating a migration from the high end of the medium-scale processor ranks to the low end of the large-scale mainframe world.

Other features of the AS/8000-series members include air cooling, which further contributes to the mainframes' small footprint, and four-way memory interleaving.

Each member of the AS/8000 processor family can be upgraded in the field to the product line's next larger model, the spokesman added.

Both the AS/8050 and 8060 require 8M bytes of main memory and expand in 4M-byte increments to a maximum of 32 bytes. The two machines also start with eight channels and support up to 24 in eight-channel increments.

The main difference between the two processors is their machine cycle times and read/write memory cycle times. A typical AS/8050 reportedly boasts a 40-nsec machine cycle and a 400-nsec memory cycle, compared to 35 nsec and 350 nsec, respectively, for the 8060.

Like the AS/8050, the 8040 also provides a 40-nsec machine cycle and a 400-nsec memory cycle. But the AS/8040 supports only 16M bytes of internal storage and 16 channels in a maximum configuration. A basic system requires 8M bytes and eight channels.

For the AS/8040, 8050 and 8060, prices begin at $1.3 million, $1.8 million and $2.4 million, respectively.

Deliveries of both the AS/8040 and 8050 start in June. The AS/8060, meanwhile, is scheduled for first customer availability during the first quarter of 1984 from NAS at 800 E. Middlefield Road, Mountain View, Calif. 94042.

Disk Subsystem Also Released

MOUNTAIN VIEW, Calif. — At the same time National Advanced Systems, Inc. (NAS) introduced its AS/8000 family of processors, it also unveiled a disk subsystem — the Model 7380 — which is geared to compete with IBM's 3380 disk systems.

The subsystem reportedly operates with NAS' new series of processors as well as with any other IBM or IBM-compatible processor using 3M byte/sec data streaming channels.

The NAS 7380 is described as a complement to the firm's existing 7360 disk subsystem and accommodates as many as four storage units, each capable of holding 2.5G bytes of data.

A fully configured subsystem incorporates a Model 7880-3 controller plus one Model A4 disk module and three B4 storage units for a total capacity of more than 10G bytes. Access times for the 7380 average 16 msec, with a minimum of 5 msec and a maximum of 33 msec, a spokesman said.

Both the controller and the B4 storage module cost $65,000, compared to $95,000 for the A4.

Shipments of the 7380 disk subsystem will begin in August from NAS at 800 E. Middlefield Road, Mountain View, Calif. 94042.

New York Mulling CRT Regulation Bill

ALBANY, N.Y. — The State of New York is considering legislation that would regulate the use of CRTs in the work place. Introduced into the state assembly last Monday by Rep. Frank Barberos (D-Brooklyn), the bill would make provisions for the following:

- Employer-paid annual eye examinations for employees working on CRTs.
- Twenty-minute rest periods for every two hours of work on a CRT.
- Semiannual maintenance of CRT terminals.
- Adequate seating and equipment for CRT operators.
- Employee "rights," including the option for operators to suspend CRT usage during pregnancy.
- Indirect or diffused lighting and radiation shielding.

Companion Bill

A companion bill was to be introduced last week into the state Senate. If the bill is signed into law by Gov. Mario Cuomo, New York employers will have a one-year grace period after its passage in which to comply with the regulations.

Similar legislation was introduced April 20 in Massachusetts [CW, May 2].

Legislation regulating the use of CRTs in the work place is also being considered in other states, namely Connecticut, Illinois, Maine and Oregon.

CDC Denies Offering Sex to Lottery Officials

By Jeffry Beeler
CW West Coast Bureau

PHOENIX — Control Data Corp. has strongly denied charges that it offered to furnish Arizona state lottery officials with prostitutes in an apparent effort to influence the awarding of a $13 million gaming systems contract.

The denial is contained in a $5 million defamation lawsuit that CDC has filed against Arizona Lottery Commission Chairman Jack L. LaSota and an unnamed associate. Filed April 28 in U.S. District Court, the suit follows recent allegations that CDC offered to procure sexual services for state lottery officials while they were visiting the company's Ticketron, Inc. subsidiary last fall.

The visit to the Rockville, Md., facility came at a time when CDC was hotly pursuing a systems contract that calls for the installation of approximately 500 lottery ticket-dispensing terminals.

Scheduled to be housed in various retail establishments throughout the state, the terminals will form part of a network that will automate Arizona's currently manual lottery operation.

Although the suit names him as a defendant, LaSota vigorously denied ever having accused CDC of offering to provide state lottery officials with illicit sexual services. The accusation, he asserted, originated instead with a member of the Arizona Lottery Commission'a evaluation committee, whose mission is to analyze proposals for the gaming systems contract and inspect potential vendors' facilities.

"No one, not even CDC, has ever accused me personally of being the source of the accusations against the company," LaSota said. Asked why, then, he has been named as a defendant in CDC'a defamation suit, he replied, "That's a good question. I'm afraid I don't know the answer."

During a telephone interview, LaSota last week admitted knowing the name of the evaluation committee member who claims to have been the target of CDC's alleged offer. But LaSota declined to reveal the accuser's identity.

The names of both the evaluation committee member and the CDC employee who allegedly approached him have apparently been turned over to the Minneapolis-based vendor, which last week voiced "deep concern" about the incident.

"We consider the charges against us to be false and terribly injurious to CDC, especially here in the Twin Cities area, where we have a large employee population," a spokesman at the company's headquarters said last week.

The evaluation committee member who was the object of CDC's alleged sex offer was part of the official delegation that traveled to Rockville, where the overture purportedly took place, LaSota said. As of May 10, nearly two weeks after the defamation suit was filed in federal court, CDC had yet to serve LaSota with a criminal complaint, the Lottery Commission chairman claimed.

The suit in question is said to be the second such legal action that CDC has taken recently in connection with the Arizona Lottery Commission's systems contract. An earlier suit, filed in mid-March in Maricopa County Superior Court, seeks to overturn the contract as it currently stands and force all interested vendors to resubmit their bids.

For the moment at least, the contract is being awarded to Providence, R.I.-based Gaming Systems Corp., one of four U.S. vendors that responded to the Lottery Commission's request for proposals.

CDC has protested the contract award on the grounds that it, not Gaming Systems, was the lowest of the four bidders.

LaSota, however, disputes CDC's contention and describes the low-bidder issue as complex and extremely difficult to resolve. "The question of which vendor submitted the lowest bid depends on whether the commission decides to lease or buy the terminals and on several other unknown variables, including our projected volume of lottery ticket sales," he said.

"If you assume certain combinations of variables, CDC emerges as the low bidder. But if you assume other combinations, the low bidder turns out to be Gaming Systems.

"There are simply too many variables for us to be able to say definitively that one vendor or another is the lowest bidder in all cases."

Ansi/ASC X12.3-1982 Gets OK as Standard

WASHINGTON, D.C. — Data Element Dictionary (Ansi/ASC X12.3-1982), a key standard developed by the American National Standards Institute'a (Ansi) X12 Committee on Business Data Interchange, has been approved as an American National Standard by the institute'a Board of Standards Review.

Copies of the new national standard reportedly will be available by July 1.

They can be ordered from Ansi, 1430 Broadway, New York, N.Y. 10018. Copies required before July 1 can be obtained by contacting the Secretariat, Ansi X12, c/o E.A. Guilbert, TDCC, 1101 17th St. N.W., Washington, D.C. 20036.

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First Wangnet User Reports Smooth Sailing . . .

By Bruce Hoard
CW Staff

MILWAUKEE — The first commercial user of Wang Laboratories, Inc.'s Wangnet has reported smooth sailing after linking two of 30 projected buildings.

The University of Wisconsin here has put the broadband local-area network to work on such diversified tasks as electronic spreadsheets, electronic mail, document sharing, program development and asynchronous access to remote computers.

Wangnet was first introduced almost two years ago. It employs a coaxial cable-based, tree-like bus topology, CATV hardware and a 340 MHz frequency spectrum.

Wangnet features four "bands": the Wang Band, designed to accommodate Wang devices; the Interconnect Band, for use with nonWang devices; the Peripherals Band, for Wang peripherals; and the Utility Band, for video transmission.

The University of Wisconsin is primarily using the Wang Band right now, according to Jack Duwe, director of administrative data processing. Duwe described a "pilot" Wangnet configuration supporting five Wang Office Information System (OIS) 140 processors, one Wang VS minicomputer and "around" 100 Wang Ergo 3 CRT terminals.

Implementation of the local-area network began with the installation of coaxial cable by a specialist in cable TV wiring. While wiring existing buildings with coaxial cable has been called prohibitively expensive by critics of the process, the University of Wisconsin did so without serious problems or exorbitant expense in about two months, Duwe said. The cable was purchased from an electronics supplier.

Thirty buildings on the 900-acre campus are scheduled for Wangnet connection during the first phase of implementation. Two were on-line last week and two more are scheduled to join them this week. The longest distance between any of them is four cable miles. All four are physically within 1½ miles of each other.

The network's bus backbone consists of 65,000 feet of coaxial cable. Trunk lines off the backbone run into each of the four buildings and terminate at whatever CPU or CPUs are there. Terminals within the building are linked to Wangnet via the CPUs, rather than being hung directly from the coaxial cable.

"We have chosen at this point not to lay lots of the smaller cable within the building to individual offices, since we have large numbers of terminals already installed with existing cable," Duwe explained. "There's no reason to pull that cable out and change it."

In the Computer Science Building, where there are five OIS processors, the word processing and secretarial pools are producing documents for individual authors who can access the manuscripts, even if the authors are physically linked to different processors.

One of the processors is running Digital Research, Inc.'s CP/M operating system and Microsoft, Inc.'s Multiplan. It shares that software with workstations physically connected to the other computers.

The university is running Mailway, Wang's electronic mail package, on the VS minicomputer and sharing it with OIS users via Wangband.

In addition, programmers on the VS system are physically connected to OIS systems in another building via Wangband. Wangband is also being used to access other computers on campus by using their asynchronous exit protocol.

Asked to evaluate Wangnet's performance so far, Duwe replied that Wang has done a good job of supporting the system by making sure Duwe's staff received training locally and from headquarters in Lowell, Mass.

Although the university is primarily using the Wang Band, Duwe has plans to use the Interconnect Band. Each of the 38 OIS 140s is connected to the school's IBM 3083 through two twisted-pair lines, one each for 3270 and 3780 terminal communications. Those lines may be converted to the Interconnect Band because of the increasing costs of leasing those dedicated lines from AT&T, he said.

Peripheral Band connections will be placed in buildings that currently require CPUs because they are "relatively remote" from other Wang CPUs but have few terminals connected.

The Utility Band is presently being used by the campus radio station, WHA, for videoconferencing.

Desktop Version Also Unveiled

AI Component Added to Ramis II DBMS

By Lois Paul
CW Staff

ANAHEIM, Calif. — Mathematica Products Group, Inc. will unveil an artificial intelligence-based English-language component to its Ramis II data base management system (DBMS) for IBM and plug-compatible mainframes here today at the National Computer Conference.

The vendor will also announce a full-function desktop computer version of Ramis II, a data base manager component of Ramis II for large production applications and support for French and Hebrew versions.

Ramis II English is the software component designed to comprehend and respond to single and multiple questions or directives phrased by users in everyday English. It is said to respond to requests with direct yes/no answers, to questions concerning "how many" and to requests requiring tabular or graphics reports.

Ramis II English was designed to paraphase unclear requests and ask the user to confirm its interpretation of the question or directive. It acts on requests posed in English, the English-like Ramis II Reporter reporting language or a combination of the two, the Princeton, N.J.-based vendor noted.

The knowledge base of Ramis II English includes three dictionaries:

- A general dictionary of the English language.
- Ramaster, the Ramis II active file dictionary that contains information on files and fields.
- An optional file specific dictionary that contains descriptions specific to an application or user.

A Mathematica spokesman explained that the English general dictionary, which contains synonyms, parts of speech and other information, does not have to be created by the user and is, therefore, available for immediate use when the product is installed. The file-specific dictionaries are optional and must be developed by the users.

The English language processor is offered as a fully integrated component of Ramis II and provides access to data stored in Ramis II data bases and Ramis II relations; sequential, Vsam and Isam files; and IBM's IMS and DL/1 DBMS, Software AG's Adabas DBMS, Cincom Systems, Inc.'s Total DBMS and Cullinet Software, Inc.'s IDMS. It will be released to test sites in October and is scheduled for formal release in 1984.

Until Sept. 30, the price of the component will range from $12,000 to $24,000.

Scheduled for availability during the second quarter of 1984, Ramis II for Individual Workstations initially will be available for machines based on the Motorola, Inc. 68000 microprocessor and running under Bell Laboratories' Unix operating system. This version of Ramis II reportedly will provide local operation of Ramis II using the same commands as the mainframe version of the product.

In addition, remote access and two-way data transfer will be provided between desktop and mainframe or between two desktop computers.

DBM, the new data base manager, will be introduced in the fall as the library manager for Titan, the vendor's interactive programming system, intended to be incorporated into Ramis II early in 1984 as a replacement for the existing Ramis II data base manager. DBM is said to encompass facilities to handle large data bases and high transaction rates that are characteristic of major production applications.

On the international front, Mathematica is adding Ramis II reporting capabilities in French and Hebrew in the fourth quarter. National language support will be provided for the Ramis II system at no additional charge.

The vendor noted that its Atlas data communications monitor, designed to use the expanded tasking capabilities of IBM DOS/VSE Release 2.0, has been extended to include Vtam support and complete integration with Ramis II. Titan also will be available with Atlas and with the Ramis II release anticipated for early 1984. Titan is priced at $12,000.

The Formatted Screen Manager (FSM) for Ramis II will add FSM for Procedural Languages, which was designed to enable formatted screens to be used with programs written in languages such as Cobol and assembler. FSM for Procedural Languages is priced at $7,500.

More information on today's announcements is available from Mathematica, which can be reached at P.O. Box 2392, Princeton, N.J. 08540.

Doors to NCC '83 Open Today on Coast

(Continued from Page 1)

sq ft); and attendance is expected to break all records.

The four-day show officially begins at 10 a.m., when John P. Imlay Jr., chairman and chief executive officer of Management Science America, Inc., will deliver the keynote address on "The Information Transformation — A Study in Survival." Imlay is the first representative of the industry's software and services sector ever to deliver the conference keynote.

At the same plenary session at which Imlay delivers his keynote address, the sponsor of NCC, the American Federation of Information Processing Societies, Inc. (Afips) will present its 1983 Harry Goode Memorial Award to a winner whose name is still secret.

The organization will also present two other awards. Its first annual Education Award will go to Prof. John G. Kemeny, codeveloper of Basic, formerly president of Dartmouth College and currently professor of mathematics there, and Afips' Distinguished Service Award will go to Dr. Richard I. Tanaka, president of Systonetics, Inc., which is based in Fullerton, Calif.

The first of 86 technical sessions related to the conference theme — "The Emerging Information Age: Computers, Communications and People" — begins at 1:30 this afternoon. In addition, half-day and full-day Professional Development Seminars, being held at the Hilton Inn at the Park, will cover a variety of topics in depth.

For example, today's seminars include "Learning From Failure," "Myths of the Computer Consultant," "How to Measure Performance of the DP Professional," "Computers and the Law," "Organizing the Data Processing Manager's Time" and "Integrating Word and Data Processing."

Computerworld *will be at NCC '83 every day. Look for the* NCC Daily! *each morning outside the door of your hotel room, at a special display in your hotel lobby or at CW's Booth N3816 in the Anaheim Convention Center.*

Complete coverage of the show will appear in next week's Computerworld.

. . . But Beta Test Site Encounters Rough Seas

By Bruce Hoard
CW Staff

NEW YORK — As the first U.S. beta test site to go public with its Wangnet experience, Chase Manhattan Bank has pushed Wang Laboratories, Inc. into a future for which it was not entirely prepared, according to John Macri, Chase's vice-president of telecommunications strategies.

The world's largest bank has also been pushed, and it is discovering that a large local-area network requires its operator to act as a vendor to appease its in-house users.

The bank will make a go/no-go decision on Wangnet sometime this summer, Macri said, adding that there have been a series of delays, some attributable to Wang, in implementing Wangnet. However, he defended Wang by saying Chase presents the most difficult topological problems that could be found anywhere.

Nevertheless, "there was some late delivery of product," Macri reported. "In the overall, Wang never ever could have made the original dates, even without our own internal delays."

Moreover, "the biggest difficulty I've had is getting [Wang] to accept systems engineering aspects, that this is a network they sold us," he said. "Just as if we bought a network from New York Telephone or AT&T, we would expect them to provide us with end-to-end diagnostics and responsibility in terms of trouble and repair."

After a series of meetings on these problems, Wang is coming around to the Chase perspective, Macri said.

Macri was also critical of Wangnet's software. He said Wang has a lot of work to do with its operating systems. Improved software will make the Wang Band much more "facile" to users, he said, noting that Wang's electronic mail package, Wangmail, is not currently usable over the Wang Band without first going through the Interconnect Band.

Despite his criticisms, Macri voiced confidence in the vendor: "They're doing a great job, under difficult circumstances, of getting this thing installed. We are very confident they are going to be successful."

Dealing With End Users

When it comes to appeasing its internal users, Chase is bringing itself over to a new perspective. Macri pointed out the inconvenience the new network poses for in-house data centers that are "working just like a Swiss watch" without it.

"From a business point of view, you have to start doing all the things that the external vendor has to do — Customer support, billing, trouble center, network control, automatic network control, 24-hours-a-day, seven-days-a-week operation."

Chase is facing that challenge by establishing an organization that will provide those services internally and by trying to run Wangnet "in parallel" with existing systems.

The Chase Wangnet was ordered in June 1982, when the necessary coaxial cable was already installed in the surrounding streets of Lower Manhattan. Active work began in January of this year, and June 30 was set as a deadline for linking 13 floors in four buildings located within two miles of each other. The idea was to test each of Wangnet's four bands.

The bank is using Wangnet's Interconnect Band — designed for use with non-Wang devices — for point-to-point communications and expects it to replace 700 rented cable pairs eventually. Chase is using a data switch feature on the band which has 256 addresses, looks like a private branch exchange (PBX) and provides dial-up capabilities to terminals.

IBM Personal Computers have also communicated among themselves and to Digital Equipment Corp. VT102 terminals on the Interconnect Band through the data switch, Macri said. In total, the band has 15 point-to-point circuits and 10 terminals located in different buildings and operating through the data switch. He said there are about 150 potential internal users for the Interconnect Band.

OIS-to-OIS Tests

Turning his attention to the Wang Band, which is exclusively for Wang devices, Macri said the bank has tested two Wang VS minicomputer systems host-to-host with a Wangnet cable kit. This week there will be Wang OIS-to-OIS tests. "On the Wang band, we just go host-to-host," he said.

"Wherever we have Wang systems in the four buildings, they will be migrated to the Wang Band over time," he said.

The Peripheral Band facilitates Wang peripheral devices. Chase plans to bring it up with workstations and serial printers during late May or early June.

The bank has tested the Utility Band and its video capabilities for voice as well as video. "We did not test a local voice circuit," he said. "We have to investigate the cost of the equipment we'd have to get to digitize the signal, and we don't know if it's economically justifiable to replace local voice circuits.

"We believe that they've got a pretty good technology or we wouldn't be fooling around with it," Macri said.

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Two Give Unix Kudos For End-User Applications

By Lois Paul
CW Staff

WASHINGTON, D.C. — Although many of its detractors have labeled it a difficult system to work with, Bell Laboratories' Unix operating system has been used successfully in a number of installations to support end-user applications.

The Investment Company Institute here is one case in point. Much of this organization's work involves maintaining statistical information about the 146 investment company groups that make up its membership.

The institute began running Unix on a Digital Equipment Corp. PDP-11/34 in 1980 to support end users performing text editing and other office automation functions. The move to Unix was part of the institute's decision to adopt a general-purpose system, explained Tondaleya Butler, director of membership and computer services.

Institute's Configuration

The DEC hardware and customized software to run under Unix was provided by RLG Corp., a Reston, Va.-based OEM and consulting systems house. More recently, the organization has brought in a second Unix-based computer — Computer Consoles, Inc.'s Office Power — to handle applications such as calendar management and meeting scheduling.

Although she has no programming background, Butler admitted, "I particularly liked Unix." She suggested that her lack of background may have helped the learning process: "I was like a sponge. I accepted without questions."

While the users working with the Office Power system do not deal with the operating system, the DEC PDP-11 users are working directly with "raw Unix." However, Butler said, the library of English language commands prepackaged by RLG to talk to Unix enables even unsophisticated users to do their work with relative ease.

Research assistant Ann Schafer was the first user at the institute trained to work with Unix four years ago. Her department is employing the Unix-based PDP-11 to track trends among members as well as to aggregate statistics on a weekly, monthly, quarterly and annual basis. Although Schafer said she lacks a programming background and therefore has nothing with which to compare Unix, she likes the operating system. "It has been easy."

Totally Dependent

Six of the PDP-11's 16 ports are used by the Research Department, whose staff has doubled since the Unix-based system was installed. Schafer said the department has become totally dependent on the system.

The day before she was interviewed, the system had been down and reports had to be produced manually, a process that took six people an entire day, she said.

Each Thursday the research group conducts telephone surveys of users of mutual funds and compiles statistics. This is a project it did not even attempt before installation of the system.

Another Believer in Unix

Office automation applications also provided the entrance point for Unix into the World Bank's Information Resource Management Department in Washington, D.C. After 13 years with a heavy mainframe-oriented Cobol banking background, Senior Computer Systems Specialist Raleigh J. Neal has become a Unix believer.

Unix was brought into Neal's department about six years ago as a pilot project to augment word processing. It initially ran on one PDP-11/70. Then there were three Unix-based PDP-11/70s. Currently there is a DEC VAX-11/780.

People have flocked to Unix, according to Neal, who feels Unix may be the medium for the ultimate merging of word processing and data processing. His group has used the operating system for word processing, time recording and some program development. The users are primarily secretaries and research assistants.

Neal's current task is to promote the use of Unix at World Bank with the help of consultant Mark Nodell. Neal has formed a task force to provide a proper structure and training.

Bell's Unix Operating

(Continued from Page 1)

It was at the well-attended January show that AT&T announced Unix System V, its first supported version of the operating system developed by Bell Laboratories' Ken Thompson and Dennis Ritchie in the early '70s.

The Unix operating system has come a long way since its introduction. Written in Bell Labs' C language for the Digital Equipment Corp. PDP-11 processor, Unix boasts portability that enables it to run on systems that include the 32-bit DEC VAX-11, Amdahl Corp.'s 470V/7 mainframe and the IBM Series/1, as well as 16-bit microcomputers based on Intel Corp.'s 8086 and Zilog, Inc.'s Z8000 microprocessors and Motorola, Inc.'s 68000-based 16/32-bit systems.

Unix was developed to support a multiuser, multitasking environment that gives each user full access to a host computer's resources on a time-sharing basis. It includes such features as a line printer, queuing, logon/logoff, monitor commands and file access that can be implemented as normal user programs rather than as operating system func-

Question Hovers on Whether Large Users Will Accept Unix

With its recent growth in popularity, a prime question is how Bell Laboratories' Unix operating system will impact installations that primarily run large mainframes.

Unix has been heavily used in office automation, research and software development environments. It is widely believed that Unix's movement to many 16-bit micros will increase its use in business and personal applications.

A number of larger installations have brought in Unix to handle office automation projects. Others are using it to handle software development on smaller and therefore cheaper machines.

Still other users are getting their first exposure to Unix by buying Unix-based systems through OEMs.

"Either this year or next, end users will get excited about Unix or they will not know they are using Unix. It will be built into products they are using," predicted Robert Rosenschein, president of RSR Associates, Inc., a Silver Spring, Md., consulting firm.

Major Drawing Card

Unix's portability may be its major drawing card for DP managers in big shops. Rosenschein said DP managers will view Unix as a vendor-independent environment that allows them to bring in a new technology without sacrificing their current software commitment.

"With a minicomputer, you can get the prompt and know what to type. Having the portable command language is what is so nice," Rosenschein said.

Although the DP manager may not care about the "technical elegance" of Unix, portability that allows him to transfer software from one machine to another and from one architecture to another will interest him, he added.

Multiuser Capabilities

Unix's multiuser capabilities also are spurring interest in DP installations of various sizes. Bob Marsh, chairman of Plexus Computers, Inc. and president of the Unix/Usr/Group, predicted that Unix will be the dominant force in the four- to 32-user environment within three years.

"I wouldn't have said that a couple of years ago because I didn't expect IBM and Hewlett-Packard Co. and all those people to get in the market so quickly," Marsh said. "It took six years to get into the CP/M market and only two years to get into Unix," he continued.

A third feature that should prove attractive is the availability of a great deal of software. "Some of those products are as sophisticated, or more sophisticated, than existed on the larger machines," Marsh said.

Ordinarily, this would seem surprising, he said, unless one considers the vendor independence of Unix, which makes it usable by a much larger target market. That means users "are willing to invest a lot more up front," he added.

Robert Rosenschein

Raleigh J. Neal

Sandra I. Heiler

CW Photos by L. Paul

Mark Nodell

System Still Remains a Center of Controversy

tions. Electronic mail is another capability.

"The market for Unix has gotten very serious very quickly," Plexus Computers, Inc.'s chairman, Bob Marsh, president of the Unix/Usr/Group, said in an interview last week. When Plexus was founded 2½ years ago to sell Unix-based systems to OEMs, there was some question about whether a viable market existed. "Now we have tremendous interest and bookings. The kinds of people we see right now are very large end users with a lot of big deals coming out of the U.S. government."

Not Everyone Happy

But not everyone is happy with Unix. Some have contended that little applications software has been written to run under the operating system. But Marsh disputed this, noting that most of the software written to run under Digital Research, Inc.'s CP/M operating system for eight-bit micros will also run under Unix. He also pointed out that the Unix/Usr/Group published a catalog of about 400 Unix offerings about a year ago.

"The bottom line is that there is more applications software for Unix than for any other operating system I know of," Marsh said. Conversion of much of this software to Unix was minimal, he maintained, consisting largely of adding the record locking and protection mechanisms that were missing in single-user systems to facilitate their handling multiple users.

In addition to the microcomputer software, data base systems and high-performance compilers have been converted to run under Unix on minicomputers, Marsh continued. Bridge products such as Dibol emulators are also being built for the Unix environment, he said.

Marsh speculated that approximately 10,000 Unix systems were installed by the end of 1982. "What is significant is there are people like [Tandy Corp.] and [Fortune Systems, Inc.] now shipping large numbers on a monthly basis. We could double and triple the installed base every year for a few years," he declared.

Unix also has been assailed as being difficult to use. Although its proponents feel this criticism is undeserved, they admit that Unix was designed with technical friendliness rather than user friendliness in mind.

Robert Rosenschein, president of RSR Associates, Inc., said the Unix command language shell is "not as friendly as it could be to the first-time user," but he and others pointed out that it is relatively easy to develop an alternative shell or front end to the operating system for less sophisticated users.

Many Using Unix to Develop Applications

Because of its "technical friendliness," Bell Laboratories' Unix is being used at a number of sites for program development.

At the World Bank in Washington, D.C., the Information Resource Management Department is downloading extracts of the Economic Work Group's huge data base, currently residing on an IBM 3031, to Motorola, Inc.'s 68000-based microcomputers running Unix. The micros are being used for program development and statistical manipulation of the data, according to Senior Computer Systems Specialist Sandra I. Heiler. "You are downloading interactive processing to a cheap machine," she explained.

In addition to Unix's capabilities as a development tool, Heiler lauded its built-in file management and word processing features. "It takes a lot of tasks end users have to worry about and makes them simple and easy."

Bell Labs' largest computing center, the Indian Hill Laboratory in Naperville, Ill., has been using its Unix operating system on IBM mainframes for several years to support up to 5,000 systems programmers in software development.

Initially, the lab ran Unix on a Digital Equipment Corp. VAX-11/780 and Western Electric 3B20 minicomputers. Processing also was done on three IBM 3033 attached processors, a 3033 Model S and a 3081 Model K running National CSS, Inc.'s Conversational Software System for time-sharing.

Three years ago, it became obvious that the increasing number of Unix users could no longer be supported by the minicomputers alone. The Indian Hill Lab then began exploring with IBM the possibility of transporting Unix to the IBM mainframes. Unix software basically was put on top of the IBM resident supervisor.

"The way we did it was we made the mainframe look like the same kind of environment as the mini, except much larger," explained Carl Hu, head of the Computing Technology Department. Hu stressed that the IBM version of Unix is by no means a general offering of Bell Labs.

"You can't control what you can't measure." —Tom DeMarco

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Expert Warns Silicon Valley Unprepared for Earthquakes

By Robert Batt
CW West Coast Bureau

PASADENA, Calif. — Computer users and manufacturers in California's Silicon Valley are completely unprepared for dealing with a major earthquake, a seismic expert here has claimed.

William Iwan, professor of engineering mechanics at California Institute of Technology, warned that unless radical improvements are made, the state could suffer massive economic dislocation resulting from an earthquake in Northern California.

His comments came in the wake of a major earthquake that devastated the San Joaquin Valley town of Coalinga in the central part of the state, causing damage worth millions of dollars.

"While there has been some attention paid to the structural design of buildings to resist earthquakes, the contents of those buildings, particularly high-technology processes and applications, have not been looked at from a seismic point of view," Iwan stated.

There is an urgent need, he asserted, to define the scope and magnitude of the problem. For example, how vulnerable to earthquakes are computers in banking institutions, where literally millions of dollars could be at stake.

Manufacturing processes used in semiconductor and disk manufacturing, he suggested, are also at risk and, if damaged, could lead to costly replacements and long production delays.

"Computer equipment is very vulnerable to seismic activity, and yet there are no more than a couple of companies in Silicon Valley who are looking to secure their computer applications from major earthquakes," claimed Iwan, who also works as a consulting engineer in the area.

"Since an enormous number of companies and people depend on computers, the economic impact of an earthquake to a company, the state and even the nation could be substantial," he added.

Silicon Valley is wedged between two major fault lines and, together with Los Angeles, is considered by geologists to be the most likely high-technology area to be affected by a major earthquake.

"The potential for a strong earthquake in the Silicon Valley is very real. It's like a fuse, the longer we delay taking action, the closer we get to the explosion," Iwan commented.

'No Relief in Sight'

Iwan's comments follow a recently issued report from the Seismic Safety Commission of California on building standards, which stated:

Wide World Photo

This was the scene in downtown Coalinga, Calif., earlier this month after it was hit by an earthquake that measured 6.5 on the Richter scale. An earthquake like that, a Caltech professor warned, would catch computer users and vendors in California's Silicon Valley completely unprepared.

"The downward trend in construction quality appears to be continuing with no relief in sight."

Reduced building department budgets, tight private-sector money, high interest rates and increased demands on professional and construction manpower have all led to a deterioration in building quality, the report claimed.

"Design professionals should emphasize the importance of earthquake-resistant design, plan checking, construction monitoring by professionals and independent inspection during construction. It is essential for construction budgets to include sufficient funds for such activities," the report added.

According to Iwan, who is also a member of the commission, the next step should be to regulate the use of computer equipment in highly vulnerable situations.

"We need to find out what the specific problems are, and then the commission can recommend legislation or establish codes for restricting or controlling high-technology equipment in those vulnerable environments," he said.

"Anything that is done now will save money later on. The companies that are farsighted will be those that take immediate action to ensure that their buildings and equipment stay intact if an earthquake does come," he concluded.

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Justice Moves to Block GTE's SPC Acquisitions

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — A decision from the Federal Communications Commission (FCC) on GTE Corp.'s proposed acquisition of Southern Pacific Co.'s (SPC) terrestrial and satellite communications subsidiaries is likely "within the next month," an FCC spokeswoman said here last week.

Her comment came shortly after the Department of Justice filed an antitrust suit against GTE in U.S. District Court here seeking to block the acquisition. Simultaneously, however, Justice and GTE lawyers unveiled a proposed consent decree which, if approved by the court, would satisfy the government's concerns.

Although there is a good chance the FCC will act on the acquisition before the court disposes of the antitrust suit, any commission decision authorizing GTE to take over Southern Pacific Communications Co. and Southern Pacific Satellite Co. would be conditioned by whatever terms and conditions the court imposes, a knowledgeable source explained.

In its antitrust complaint, the Justice Department alleged that GTE, by acquiring the two SPC affiliates, would gain both the incentive and the ability to engage in behavior that is illegal under the Sherman Antitrust Act.

Specifically, GTE — which is the nation's second largest telephone carrier, serves 31 states and interconnects 13 million telephones representing 8% of the U.S. total — could deny or restrict interconnection of those telephones with competing interexchange carriers, according to the complaint.

GTE operating companies could also cross-subsidize on-line information services and other unregulated offerings with revenue derived from basic telephone service, the complaint contends. Such cross-subsidization would discourage others from offering their wares in areas controlled by GTE operating companies, Justice said.

A Major Goal

A major aim of the proposed consent decree is to "circumscribe GTE's ability, through ... the [operating companies] ... to foreclose or impair the development of competition in ... the provision of interexchange telecommunications and information services," the Justice Department said in a "competitive impact statement" accompanying the proposed consent decree. The following are the decree's major provisions:

- Information services offered by GTE operating companies would have to be separated from the company's regulated activities for at least five years. However, terminal equipment could be offered directly by an operating company. The separation requirement could be met through formation of either a separate subsidiary or "an unincorporated division maintaining separate books of account."
- GTE operating companies must provide nondiscriminatory access to all interexchange carriers and would be forbidden to offer interexchange service. However, both of these provisions are to be imposed gradually. Operating companies would have until 1990, for example, to provide equal access through end offices terminating more than 10,000 access lines each; however, some end offices equipped with electronic, stored program control switching facilities would have to provide equal access by Jan. 1, 1985.
- GTE operating companies would be barred from offering new interexchange services, and GTE could not acquire additional interexchange carriers without court or Justice Department approval.
- The Justice Department could seek further relief, including divestiture of the the acquired Southern Pacific companies and/or the GTE operating companies, if GTE violates the consent decree.

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STAMFORD, Conn. — The Techtran subsidiary of The Gartner Group, will present briefings for IBM users on "Planning for Extended Architecture (XA)" and "Data Facility Products" in New York, June 1-3, and San Francisco, June 8-10.

Both briefings are aimed at technical support managers, performance analysts, senior systems programmers and software suppliers. "Planning for XA" is designed to help attendees evaluate the significance of the MVS/XA announcements, analyze its true impact and cost and prepare for a smooth move.

"Data Facility Products" will tell how the new generation of data storage management software will result in improved direct-access storage device performance, evaluate the significance of the Data Facility products and analyze their effective use.

At both sites, "Planning for XA" costs $395 and "Data Facility Products" costs $495. One can attend both for $595. There are savings for registrations before May 23 and for multiple attendees.

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Crime in Chicago: Data Base Search Reveals

By Paul Gillin
CW Staff

CHICAGO — Crime may not pay for you, but for dozens of petty thieves here it was paying quite nicely, the Chicago Police Department found recently.

As an experiment, the Detective Division last year asked the department's Data Systems Division to compile a list of people who had been convicted of 13 or more crimes during the preceding two years. To their amazement, the computer churned out the names of 38 people who collectively were responsible for more than 800 arrests. One man had been arrested 84 times.

Upon further scrutiny, the detectives found that nearly all the convictions were for shoplifting, a crime that is estimated to cost Illinois businesses more than $1 billion annually.

The department mounted a visible and successful program to prosecute these "career" shoplifters as felons by virtue of their multiple convictions.

In the past year, 15 of the chronic shoplifters have been convicted of felonies and the department is now targeting its computer application to cover a wider variety of crimes within the next two years, according to Lt. Michael F. Caccitolo, commander of the Detective Division's Administrative Division.

The computer search was the outgrowth of an innocent question posed by Caccitolo in 1981: "I wanted to know who was the most active criminal in the city of Chicago." Even though police records were already computerized, "I found nobody could answer that."

At the detective's urging, the department sought the computerized match from its data base of 78,000 arrest records for the previous two years. The Data Systems Division was in the process of reformatting its entire file structure onto Vsam files on an IBM 3081 mainframe, and Caccitolo's request was "a fairly simple operation," according to Bob Miller, manager of systems and programming. The findings, however, were startling.

"People were finding it cost-efficient to shoplift," Caccitolo said. "They were coming into court with $8 and $12 items, and the judge wasn't going to sentence them for that. They were falling through the cracks in the judicial system."

List of Offenders

The department distributed a list of the chronic offenders to 15,000 retailers in the Chicago area. The department also mounted an internal effort to flag the career shoplifters so they would not escape judicial attention in the future.

At the same time, the detectives commissioned a similar list to be drawn up for "serious" offenders, those who had been convicted of three or more crimes such as robbery, burglary, rape, murder or carrying a concealed weapon. Again, the results revealed the extent to which a few

Dartmouth to Link IBM Micros With Host

HANOVER, N.H. — Once again the hallowed halls of Dartmouth College are housing both traditional Ivy League education and futuristic technological advancements.

The college, which has the invention of Basic (1963) and the widely acclaimed Dartmouth Time Share network (1964) to its credit, has expanded its existing computer center in the Amos Tuck School of Business Administration with the acquisition of approximately 50 IBM Personal Computers.

The Personal Computers will not only be used as stand-alone devices, but will also function as intelligent terminals hooked into Dartmouth's mainframe computers.

"We have a homegrown communications package that allows for communications between the [Personal Computers] and the mainframes," explained Associate Professor in Operations Management Dean Kropp.

"It's the closest thing to a local-area network we've got."

'Among the First'

Kropp believes Dartmouth is among the first to link IBM's Personal Computers to host mainframes in a university environment. He said the 50 computers at the business school — which result in a ratio of one computer to seven students — will be predominantly used for spreadsheet analysis and word processing by the students.

According to Paul Argenti of the school's Communications Department, almost every course at Tuck requires the use of a computer in some way, and with 50 Personal Computers, he believes the quality of the school's education will "be impressive."

The implementation of the Personal Computers is slated for this summer, and they should be up and running for the fall semester. But with computing power going up and costs continuing to come down, Kropp foresees the process of acquiring personal computers as an ongoing thing.

"Three to four years from now, I can envision every student having an IBM [Personal Computer]," he said.

"While we do have a lot of mainframe capability here, we just can't afford to ignore personal computers."

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Rampage of Chronic Shoplifters

people influence the crime picture.

"We found that .8% of the people arrested for serious crimes accounted for 5.1% of all arrests and that 7.5% of the people were committing 22% of the serious crimes," Caccitolo said. "If you assume they're only being arrested once for every three crimes they commit, that's a lot of incidents."

The department has not taken any action on the data base of serious offenders, Caccitolo said, but he expects an effort similar to the shoplifting watch to be launched within the next two months. The detective maintains that the tracking system is not a form of harassment, but rather an example of effective recordkeeping.

"We're not targeting these people before they're arrested, but we're identifying them. And whenever one is taken into custody, regardless of the offense, the police are going to conduct a full investigation," Caccitolo said.

Chicago Police Lt. Michael F. Caccitolo believes the police department of the future will automate nearly all of its information resources.

System Advocated as Whodunit Tool

By Paul Gillin
CW Staff

CHICAGO — If the charge is being a little starry-eyed about technology's potential in the police department, Lt. Michael F. Caccitolo pleads guilty.

Caccitolo, commander of the Administrative Division within the Chicago Police Department's Detective Division, advocates streamlining police recordkeeping with computers. The battle is an uphill one in a city plagued by the typical urban problems of too much crime and too few resources to battle it. But little by little, changes are being made, he said during a recent interview here.

Using computers, the police department has conducted a successful program to prosecute chronic shoplifters and plans to expand the system to include serious criminals and career pickpockets . And Caccitolo believes the police department of the future will automate nearly all of its information resources.

By next January, an arsenal of 24 terminals will be deployed in area offices throughout the city for case reporting and eventually for on-line access to police data bases, according to Ronald Manka, DP director for the police department.

The on-line query system was cost-justifiable even in a time of tight budgets, Systems and Programming Manager Bob Miller said. "The real problem has been the time lag between the decentralized detective divisions and the keypunch areas downtown," he added. "Under the on-line system, the police will have access to case reports within a few hours of the time the report is filed."

First-year cost savings are estimated at $1 million, mostly from reduced legwork required of detectives. The system will include a Mathematica Products Group, Inc. Ramis II data base management system for on-line query capabilities that detectives can use.

"The department handles at least 300,000 case reports a year, and a particular detective handles each case," Caccitolo said. "In a 14,000-man department, it's often impossible for a victim to trace his detective again," particularly if the paperwork has not had a chance to move through the manual records system.

Under the planned system, a victim will be able to contact his detective immediately for information or updates on his case. Caccitolo would like to expand the filing system in future years to allow case records to be queried on-line according to a variety of fields.

Ultimately, Caccitolo would like police to be able to type a description of a suspect into a terminal and have a list of all people who have been arrested and match that description appear on a printout. Mug shots and police lineups could be recorded on videotape, he maintained, so the information could be accessed from any station.

Caccitolo admits that computer equipment is a low priority in a department strapped for funds. "Computers around here are on about the same level as bologna sandwiches," he said.

But he is confident that increased automation is coming. "The Chicago Police Department budget is about $400 million a year, and 95% of that is for salaries," he said. "With a detective's salary running about $15 an hour, we've got to be more efficient in using that time."

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Adapso Split in Vote Not to Sue Big Eight Firm

By Bill Laberis
CW Staff

NASHVILLE, Tenn. — How close did the Association of Data Processing Service Organizations (Adapso) come to filing suit against Arthur Andersen & Co. at Adapso's 58th Management Conference here last week?

It is difficult to gauge. On one hand, Adapso's Certified Public Accountant (CPA) Relations Committee, following an animated two-hour meeting at the conference, overwhelmingly voted to sue the Big Eight accounting firm on grounds of Andersen's alleged unfair competitive practices in selling computer services to audit clients.

On the other hand, at a closed session of Adapso's executive board the next morning, the board negated the committee's vote to sue, choosing instead a multipronged approach to resolving its long-standing beef with the Big Eight over the sale and marketing of computer services to audit clients. Part of this approach will include the aggressive pursuit of evidence in preparation of a possible lawsuit, something which many Adapso members said last week is inevitable.

But the meeting of the CPA Relations Committee pointed out some key impediments to litigation against Andersen or any other Big Eight firm, despite heated overtures from many Adapso members who, from appearances, are spoiling for a court fight.

Committee Reviews Efforts

The committee meeting began with an overview of Adapso's efforts to date in dealing with the accounting firms. These efforts have included dialogues with the firms, which the committee members felt were largely fruitless; intensified lobbying in Congress to put pressure on the Federal Trade Commission (FTC) and Securities and Exchange Commission (SEC); and public pronouncements of Adapso's gripe, which states that the Big Eight firms abuse their audit powers in landing over $500 million of computer service business per year. Andersen accounts for over half that amount, the committee claimed.

While some committee members said they preferred to work through the SEC and the FTC, claiming that the Big Eight firms have violated antitrust and securities laws and regulations, others felt the conservative mood in Washington, D.C., would thwart efforts to involve those commissions actively. Adapso claimed to have had some success with the commissions in the late 1970s, when the SEC promulgated broad rules that, Adapso said, were designed to limit the scope of the Big Eight's business operations regarding the sale of computer services to audit clients.

However, in mid-1981, the SEC, under the leadership of the former vice-chairman of a stock brokerage house, rescinded a key SEC ruling pertaining to the Big Eight and computer services.

Recognizing the failure of past efforts, committee members last week began clamoring for litigation. Jay Goldberg, president of Software Design Associates, Inc., said, "There is a lot of feeling among people in professional services that the only way this issue is going to be resolved is through litigation." Goldberg later cast the only dissenting vote on the litigation question, saying Adapso needed more time to gather evidence.

CW At Adapso

"There is no chance we are going to achieve what we're after through discussion with them," said another committee member.

But some sobering realities became apparent as the meeting progressed. For one thing, Milt Wessel, Adapso's general counsel, said any suit filed by Adapso would have to include the name of a member company as a co-plaintiff. Many, if not most, of Adapso's 575-member companies do business with the Big Eight firms directly. Others rely on the accountants for important referrals during the audits of major companies where the audits indicate a need for enhanced computer services. Thus, there were no volunteers for co-plaintiff.

No Volunteers

There were no volunteers, either, when Douglas Jerger, committee chairman, asked for company executives to be included on a list of press contacts regarding the Big Eight matter.

Wessel speculated that the cost of the suit could run "into hundreds of thousands of dollars." And given the evidence of the Big Eight's or Andersen's alleged illegal activities gathered to date, Wessel told the committee, "You could file a lawsuit . . . but it would be a weak one now."

In an internal document circulated recently among the Adapso membership, Wessel's office said, "It should be noted that while the theories underlying Adapso's antitrust claims are responsible and based generally upon the principles underlying traditional antitrust theory,

(Continued on Page 15)

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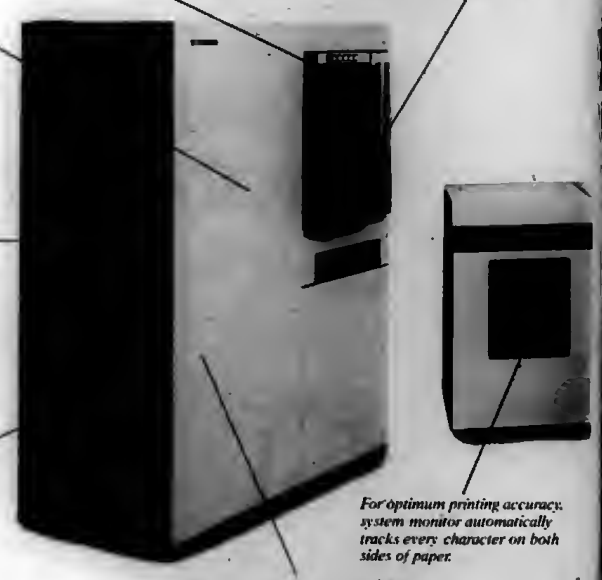

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Growth, Environment More Important

Raises Seen Not the Best Motivational Factor

By Bill Laberis
CW Staff

NASHVILLE, Tenn. — As a DP manager, is the merit pay raise the most potent weapon in your employee motivation arsenal? Do you send staff members on business trips without first checking whether they like to travel? Do you manage some employees at remote sites, away from the department mainstream?

If your answer is yes to one or more of these questions, you may have a morale problem and therefore a crying need for motivational stimulation on your hands.

This was the message delivered by three speakers at a work session of the 58th Management Conference of the Association of Data Processing Service Organizations (Adapso) here last week.

In addressing the question of what motivates the DP employee, Jack Murray, senior vice-president of Computer Horizons Corp., paraphrased motivation guru Fred Hertzberg in telling his audience, "If you think you're motivating your people with money, you're mistaken."

Until this year, DPers had been accustomed to annual raises in the 10% to 20% range, much of which was spurred by rampant inflation, Murray said. Several consecutive years of such healthy raises produced a situation where money as a motivator "was like washing your hands; they just got dirty again the next day," he said.

CW At Adapso

Speaker George Florit, president of Berton Group, Inc., agreed with Murray's thesis, saying his experience has shown that cash awards rank "a distant third behind professional growth and a suitable social environment" as wellsprings of employee motivation.

This year, however, inflation has clearly abated and raises of 5% to 8% will be the norm, Murray said. For DP managers, the result may be a motivation crisis. Murray's motivation prescription, therefore, included a laundry list of nonmonetary items to stimulate the DPer in 1983.

First, managers must strive to imbue DPers with a sense of involvement and contribution to the organization, while being extra careful to recognize personal accomplishments. In Murray's words, "A well-placed bottle of wine at the right time can have more benefit than a merit pay increase." He also recommended that managers organize workers within group projects to relieve them of the mundane and repetitive tasks that often characterize the DPer's day.

Managers should also tailor the DPer's work schedule to his skill level and predilections, Murray continued. Thus, a programmer with a penchant for data base should not be unnecessarily cast into an applications role.

Berton Group's Florit stressed a thorough, year-long orientation to ensure that employees do not become submerged within a large organization. At the Berton Group, this orientation includes 30 days of on-site supervision, 30-day performance reviews at the end of the first, second and third months of employment, and jointly developed training plans spanning the first year of employment, with specific goals set forth.

Herb Lopato, district manager for American Bell, Inc., explained a variety of techniques he employs to motivate and stimulate about 160 Bell employees and 150 consultants under his direction.

High on Lopato's list is the provision of short-term work assignments "that provide immediate ego gratification." Lopato recommended breaking up long-term projects into increments no longer than four months' duration to "keep it short and measurable."

Adapso Divided On Suit Decision

(Continued from Page 14)

they do represent some development of that theory. As such, Adapso's claims may not be favorably received by a judiciary which has recently begun to take a more conservative approach."

Commenting on the executive board's vote rescinding the committee's decision to file suit, David Campbell, president of Computer Task Group, Inc. and both a board and committee member, said Adapso will step up lobbying efforts in Congress to bring pressure to bear on the SEC and FTC.

Asked about the possibility of litigation against a Big Eight firm in the future, Campbell said, "I think it is likely we will some day initiate litigation. The government and the [Big Eight] companies have left us no choice."

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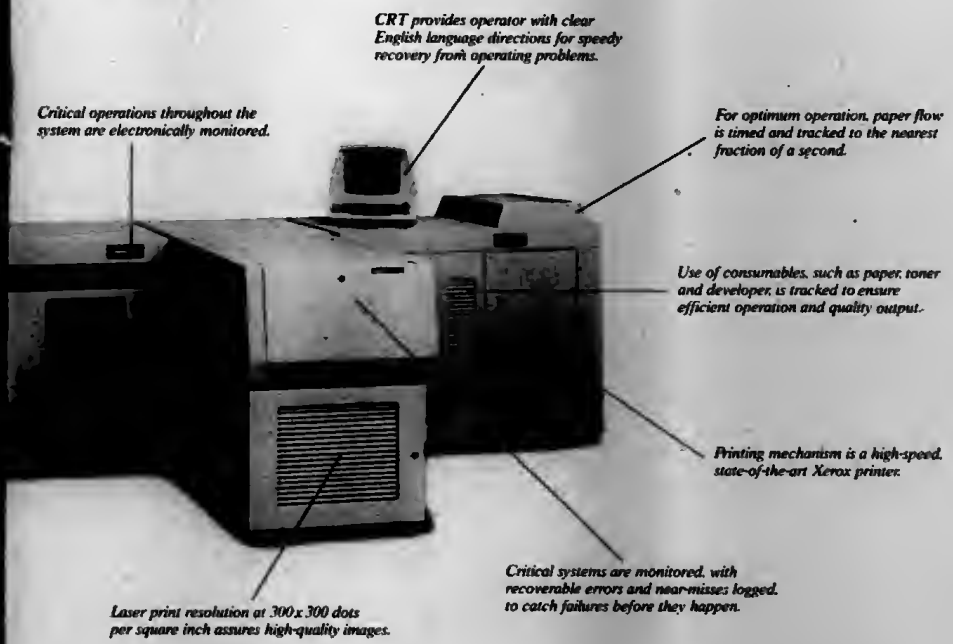

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Senate Hears Private-Sector Support of S. 999

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Legislation to create a White House office for international telecommunications and information policy received support from the private sector last week. However, the proposal continues to be viewed skeptically in influential government circles.

Spokesmen for several corporations, including Control Data Corp., AT&T, ITT, Communications Satellite Corp. and MCI Communications Corp., told the Senate Communications Subcommittee last week that the apppointment of a special representative for telecommunications and information, as envisioned in S. 999, would be an important first step in making these subjects a high priority within the government.

The Defense Department, however, told the Senate subcommittee that the authority of the new office and the executive branch task force the special representative would head might interfere with defense communications.

Donald C. Latham, deputy undersecretary of defense for communications, command, control and intelligence, said he is "concerned ... that as presently written, the reorganization contemplated in S. 999 could result in unintended intrusion of the special representative or the task force into our myriad day-to-day international communications operations."

Any authority of the new office to "make, review or approve the many planning, programmatic and operational decisions affecting our telecommunications systems and operations" could seriously hamper those operations, according to Latham. He suggested that the State Department's recent reorganization of its international information and telecommunications activities may be sufficient for U.S. government handling of those matters.

Diana Lady Dugan has been named coordinator of international communications and information policy with the rank of ambassador at the State Department, a move Latham said makes enactment of the special representative provision of S. 999 unnecessary. The State Department also claimed that its new organizational structure adequately fills the role set out in the Senate bill.

Concerns similar to those of the Defense Department were expressed by Federal Communications Commission (FCC) Chairman Mark S. Fowler, who praised the concept of the special White House office, but said he is worried that its responsibilities may go beyond policy coordination, "reaching into the realm of policy making," which, he said, could interfere with FCC activities.

Fowler nonetheless endorsed creation of the new office "because it would be helpful to have a high-level, central voice for administration policy on international telecommunications." He asked the subcommittee, however, to spell out carefully the authority of the special representative and the proposed task force.

Private-sector witnesses at last week's hearings were more unequivocal in their support of the bill. One, CDC's Phillip C. Onstad, called the new office "absolutely essential" (see story below).

Foreign Rate Hike of 700% Warned

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Attempts by the U.S. to impose its procompetitive position on foreign nations could mean a whopping 700% increase in the communications bills of multinational firms.

That warning was issued last week by Philip Onstad, assistant to the general counsel of Control Data Corp., at a Senate hearing on S. 999, a bill that would alter the way the executive branch develops international telecommunications policy.

Onstad was referring to an August 1982 decision by the Federal Communications Commission that allows U.S. international communications carriers to offer on-line information, remote data processing and other "enhanced" services without filing a tariff or getting the commission's approval.

Foreign carriers oppose this move on two counts: First, they were not consulted beforehand; second, they fear it will encourage users to share circuits instead of leasing them on a full-period basis, thus reducing the foreign carriers' revenue.

U.S. multinational companies, Onstad said, believe the foreign carriers will retaliate by imposing usage-sensitive communications rates and by requiring use of their public data networks.

In an interview after the Senate hearing, he added that a recent survey of U.S. companies operating overseas disclosed that if they were forced to pay usage-sensitive rates instead of the present usage-insensitive monthly charges for circuits leased from European carriers, the average communications bill would increase 700%.

U.S. companies cannot defend themselves if foreign carriers raise rates or retaliate in other ways against U.S. deregulatory policies, according to Onstad.

"When a company comes to the U.S. government for help, it soon finds that responsibility and authority for international telecommunications and information matters are divided among many departments and agencies. The company finds itself being bounced from one agency or department to another without obtaining relief," Onstad told the subcommittee.

S. 999 would reduce this confusion by authorizing appointment of a "special representative for telecommunications and information," who would be a member of the White House bureaucracy.

The special representative's major mission would be to coordinate telecommunications policymaking and thus reduce the "fractionated responsibility and authority inherent in the current structure," Onstad explained.

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AT&T to Greene: Access Fee Due to Competition

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Competition, not the breakup of the Bell system, is the main reason local telephone rates will increase after divestiture, AT&T said here early this month. The comment was addressed to federal District Court Judge Harold Greene, who is presiding over implementation of the antitrust settlement AT&T and the Justice Department negotiated last year.

The phone company, which wants Greene to accept the reorganization scheme it submitted to him last December, apparently became concerned when the judge indicated some changes might be necessary because of the Federal Communications Commission's (FCC) access-charge decision. Under that decision, beginning next year, all users will have to pay their local telephone companies an additional fee to reimburse them for providing access to the long-distance telephone network. Much of this access cost will be levied in the form of a flat charge. Greene recently said this part of the FCC's decision "runs directly counter" to one of the principal purposes of the antitrust case settlement — that "the fostering of competition in the telecommunications field need not and should not . . . cause increases in local telephone rates."

In its recent comment, AT&T argued that the FCC had to shift long-distance charges from usage-sensitive fees to flat rates because of the bypass threat.

According to the phone company, it costs a local telephone company an average of $7/line/mo to provide access to the long-distance telephone network. Presently, this bill is levied directly on the interstate carriers who pass it on to their customers in the form of usage-sensitive charges. As a result, some users pay much more than others. "One percent of the Bell operating companies' customers account for 42% of the revenue necessary to recover the $7/line/mo," AT&T told Judge Greene, adding that "the average access payment of these high-volume customers is about $160/line — 23 times the price they would be charged on a [flat-rate] basis."

No customer will pay this much to access the long-distance network if less expensive competing facilities are available, the phone company pointed out, adding that "the technology is here today" to support bypass throughout the nation.

Nata Criticizes Bell's Service Fee

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — The North American Telecommunications Association (Nata) presented the Federal Communications Commission early this month with "documentary proof of the Bell system's use of the [Maintenance of Service Charge] to discriminate against competitive telecommunications equipment vendors."

Nata represents many manufacturers of what is usually referred to as interconnect equipment. For at least three years, non-Bell terminal makers have been trying to eliminate the service charge AT&T imposes on users of non-Bell terminals.

The latest chapter in this argument involves John Roselli, a New York antique dealer, who was billed $195 last summer by his interconnect supplier for diagnosing a service failure that was due to circuit facilities supplied by New York Telephone Co. When Roselli asked New York Telephone to pay this bill, his request was refused. "In order to avoid similar problems in the future," a phone company service representative wrote, "you should consider changing to Bell system equipment. There are no charges for repair problems on our equipment."

"The letter's message is clear and all too familiar," Nata President Edwin B. Spievack said. " 'If you buy from us, you get free maintenance; if you buy from a competitor, you don't.' Although New York Telephone's claim of free service is incorrect, such use of the [Maintenance of Service Charge] as a tool to thwart competition occurs all too frequently. If there was ever any question about the . . . need to eliminate the [Maintenance of Service Charge] . . . that doubt is totally dispelled by New York Telephone Company's letter," he said.

In earlier rounds of this argument, Nata has argued that the Maintenance of Service Charge is anticompetitive because it is imposed only on users of interconnect terminal equipment when AT&T's repair technician finds that the terminal, rather than the line, is responsible for a service breakdown. If the trouble is due to a Bell-supplied terminal, no maintenance charge is levied.

However, as AT&T has pointed out, maintenance is included in the user's monthly terminal equipment charge, so the service call is not free.

Nata insists this terminal charge has never been broken down to show how much the user is actually paying for maintenance. Therefore, it is difficult, if not impossible, for him to determine whether non-Bell equipment would be more cost-effective.

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Computer Trade Marts to House Conferences,

By Paul Gillin
CW Staff

The day is still far in the future when a company will fill all its DP needs in a single walk-in environment. But a host of commercial developers are now betting that the trend is in that direction.

Plans for computer trade marts — or permanent computer exhibition and conference centers — have been sprouting up with increasing frequency in recent months. Proclaimed as a new concept in computer marketing, they will offer major conference facilities and educational programs, permanent exhibit space and advanced demonstration capabilities under one roof, according to developers.

At least five computer trade marts geared toward the volume buyer have been announced — in Boston, Dallas, New York, San Francisco and Toronto — and others are being considered in Miami, Atlanta, Chicago, Los Angeles and Philadelphia. They range in size from the 112,000-sq-ft New York Computer Center to the 1.4 million-sq-ft Boscom market center in Boston.

The centers will be targeted toward buyers of systems and software for large and medium-size installations. Permanent exhibits will change regularly to accommodate the myriad of trade groups that developers hope will hold conferences at the trade marts. In addition, most facilities will be open daily for demonstrations and educational programs. Some vendors may even move offices into their exhibit space.

Buyers will save travel expenses while being able to see several vendor demonstrations in a single day, according to developers. "Buyers are confused and they need an environment in which they can compress that very costly buying cycle," said Bill Winsor, general manager of Infomart.

But while announcements have been accompanied by a great deal of fanfare, observers and even developers admit that the concept is too new and untested to be evaluated effectively. Marketing studies indicate that the showrooms have promise — a Strayton Corp. study commissioned by Boscom found that 63% of top computer executives surveyed said they would visit a computer market center.

Clearly, there is interest from users. "I'm very impressed. It will be effective for someone in my position

(Continued on Page 19)

Centers to Target Volume Buyers, Specific Needs

Although its name may evoke images of a high-tech shopping mall, the computer trade mart is more like an expanded demonstration center, according to developers and vendors interviewed by *Computerworld*.

Almost across the board, the centers will be targeted at volume buyers from large and medium-size businesses, developers said. In most cases, outright sales will be prohibited on the floor.

Permanent exhibits will probably display a range of products. Many will have attached demonstration centers. The IBM exhibit at Boscom, the Boston market center, "will be a comprehensive look at the IBM product line," from microcomputers to mainframes, an IBM spokesman said. The company's 20,000-sq-ft display is intended "to get in as much product space as possible," he said.

Most centers will screen visitors by charging a liberal admission fee or requiring visitors to register and identify the kinds of products they want to see. "We want to prevent the trade show environment where you've got thousands of people not really knowing what they want, but just walking around," said Barry Segall, vice-president of the New York Computer Center.

The price to get in can be steep; Boston's Boscom will charge $35 to someone walking in off the street, a measure aimed "at keeping the tire-kickers out," according to Jack Cochran, Boscom's vice-president of marketing and programs.

Instead, the trade marts will rely heavily upon drawing attendees with specialized needs. Toronto's Systems Mart plans to sponsor a continuous program of Market Weeks, addressing such topics as word processing, purchasing, transportation and manufacturing. Temporary exhibit space will be available to vendors targeting those special groups, and permanent exhibits will likely be geared to the changing characteristics of the audience.

The marts are also sponsoring trade shows and conferences and positioning themselves close to major conference centers. Dallas' Infomart, for example, claims to have 26 shows scheduled for the first nine months of operation. Boscom's plans include 55,000 square feet of meeting space encompassing two 250-seat auditoriums and 45 meeting rooms.

When not catering to special events, all trade marts will be devoted to demonstrations and sales pitching. "We see it as a market support center. It's a method of demonstration and support," said Bill Winsor, general manager of Infomart.

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Exhibits, Programs

(Continued from Page 18)

who spends a lot of time at trade shows," said John Rutter, director of Systems Management at Polaroid Corp. in Waltham, Mass. "It could be a convenient demonstration tool for corporate users."

However, few DP managers have been briefed on the planned facilities since the announcement blitz began, and observers question whether the market ultimately can support more than a half dozen of the market centers.

"There's a lot of smoke being puffed out there and there is a long way to go before these things are translated into reality," according to Peter Young of the Interface Group, a Framingham, Mass.-based firm that manages many trade shows.

"A lot of developers don't have any concept of what it's all about," according to Brad Griffith, executive vice-president of Leggat, McCall and Werner, a Boston-based developer that scrapped plans for a trade mart in Dallas last year.

"We were in it for a year and realized that it was a lot more than real estate — it's a business. Very few developers we have talked to understand the risks involved," Griffith contended.

"Every developer with an empty building is thinking about opening one," Jack Cochran, vice-president of marketing and programs at Boscom, said.

Smaller developers are relying upon a regional emphasis to sell the concept. "We're not competing with Boscom," said Barry Segall, vice-president of marketing for the New York Computer Center, a $10 million trade mart scheduled to open in December.

A Number of Uses

"In any regional city you get specialized trade shows with space renting at $14/sq ft for four days. Here the vendors can get space for $30/sq ft that can be used as office space or for any number of other uses," Segall said the New York Computer Center will be the first of a string of regional trade marts in New York, Atlanta, Chicago and Los Angeles.

Toronto's Systems Mart, which was announced last week, reported no commitments from vendors yet, but expects to house about 60 vendors doing business in Canada when it opens in the summer of 1984.

"We're not concerned about competing," according to Helen Briggs, project director for the 256,000-sq ft project. Briggs explained that "Toronto is Canada's business center and Canada is that much different from the U.S. market."

A San Francisco developer has targeted a September 1984 opening for California Datamart, reportedly a 142,000 sq-ft facility.

Dallas' Infomart will encompass one million square feet.

Computer Marts In Boston, Dallas Gain Bookings

The key to computer mart success will be the ability of each project to attract major trade shows and vendor commitments. Boscom and Infomart have proved to be successful at that task.

Boscom claims to have letters of intent from more than 120 vendors and nine trade associations. Dallas' 1.1 million-sq-ft Infomart reports that 85 vendors are committed to permanent exhibit space, while 26 trade shows are booked for the first nine months after its scheduled opening in the spring of 1984.

But some observers believe a shakedown is bound to occur as major vendors pick and choose the trade marts that generate the most business. IBM, for example, has leased 20,000 square feet at Boscom, but has taken a pass on Infomart. And other major vendors, including Data General Corp., Digital Equipment Corp. and Hewlett-Packard Co., are uncommitted to either major project.

"The potential is directly related to the support [the marts] get from the industry," according to John Forbes, director of corporate communications at M/A-COM, Inc., which will lease space at Boscom. "I don't question the concept that much, but if you dilute it and have 10 of them around, it's going to confuse the matter."

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Located Near Convention Center

New York Computer Center Set to Open in '84

By Bob Johnson
CW New York Bureau

NEW YORK — The New York Computer Center (NYCC) will offer computer information to everyone from large system DPers to home computer hobbyists, according to its developer, the Atlantic Coast Development Corp. of Hallendale, Fla.

Scheduled to open by early 1984, the $10 million project is one of six centers planned for major cities around the country. It will be located one block away from the New York Convention Center, a $375 million effort slated to open in the summer of 1984.

Between 80 and 100 permanent exhibitors are expected to establish showrooms on the computer center's upper floors, with the exhibition hall below available for other events.

Six Floors of Space

According to Barry Segall, vice-president of marketing for the developing company, the computer center will include six floors of exhibition space, conference rooms, technology displays, a visitor information center and a communications network. No retail sales will be allowed at the NYCC, he said, but orders will be permitted.

Although the New York entry into the computermart arena is similar to other recently announced centers such as Boscom in Boston and Infomart in Dallas, it will also include an aggressive vertical marketing program as support.

"Every time a major segment of a vertical market holds a conference or show at the New York Convention Center, we will have a special computer show at our center to coincide with it," Segall said.

A half-million dollar publicity and advertising campaign will target professionals two months before their scheduled attendance at the convention center, Segall said.

In his opinion, vendors have been more concerned with product development than with marketing, their usual way of getting interested professionals together being through "ineffective, sporadic seminars."

He maintained that the result was often many regional seminars trying to reach the same interest group at different times.

A vendor leasing space at the computer center (about $30/sq ft) will be able to reach a major portion of a professional group and gear its exhibits directly to that group, according to Segall.

In addition, special displays and shows can be presented by tenants in the center's exhibition hall.

NYCC will also have an automated lobby called the "Data Core," where graphic printouts will be available listing what products are offered by tenant/vendors and where they are located in the building. A "Future Works" area, divided into two sections displaying functional operating equipment — "Future Office" and "Future Home" — will also be part of the center.

"Future Office" will be a fully staffed, glass-enclosed exhibit that will also offer a time-shared service for tenants.

Video and teleconferencing by microwave and satellite communications will be available to tenants, as well as an in-house network connecting the showroom areas, the "Future Works," exhibition hall and conference/seminar areas, Segall said.

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Army to Test Microchip Version of 'Dog Tag'

By Patricia Keefe
CW Staff

FT. HARRISON, Ind. — Bringing the military "dog tag" into the technological age may well be the key to the paperless war, according to the U.S. Army. The Army plans to conduct tests this year to determine the feasibility and utility of microchip versions of the tags.

If testing is successful, Army troops could be issued plastic tags or cards with an embedded microchip carrying a soldier's complete training and medical histories as well as his name, rank and serial number by late 1985, according to Chris Occhialini, the civilian chief of the High Technology Personnel System Project here.

The main reason for the microprocessor-embedded cards — which are officially called Soldier Data Cards and resemble standard bank or credit cards — is to speed access to each soldier's personal records.

For example, data from the tags could be fed into portable computer terminals in the field and relayed via a coded FM channel to headquarters, providing military command staff with an immediate picture of troop strength and location during battle.

This form of paperless recordkeeping could slash by as much as 50% the number of personnel clerks required in the U.S. Army, several Army officials said.

Testing plans for the Soldier Data Card, which has a 64K-bit electrically erasable programmable read-only memory, calls for both peacetime and simulated wartime applications. The Army is now considering an off-the-shelf system from Data Key and equipment only, Occhialini said.

Peacetime applications of the card will be tested this summer here at Ft. Harrison. The primary goal is a reduction of personnel support staff, reliance on paper and the amount of time it takes to process information.

This fall, the cards will be tested during military exercises by 3,000 9th Infantry Division soldiers at Ft. Lewis in Yakima, Wash. Soldiers in the 3rd Brigade will wear the small brown plastic tags, while fellow "dogfaces" in the 1st Brigade will wear the conventional metal dog tags.

'Too Much Paper'

The army is considering the Soldier Data Cards because "there is too much paper and too little time in which to handle it," Occhialini said. He cited an estimate that it would take 400 five-ton trucks just to move Army records out of Europe.

In addition, paper requires an "inordinate amount" of space to store and has the added disadvantage of being inflammable. A fire 10 years ago in St. Louis at the Reserve Component Personnel Administration Center wiped out an entire floor of records for which there were no copies, Occhialini recalled.

The Army is currently the only U.S. military group investigating use of the cards, but it is keeping other branches apprised of the project's progress.

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Ansi Unveils Dictionary Of Terms

WASHINGTON, D.C. — The American National Standards Institute's (Ansi) X3 Information Processing Systems Committee has developed a dictionary of technical terms and abbreviations.

The publication covers computing, data communications, data processing, word processing and related fields. It is called "The American National Dictionary for Information Processing Systems" and was developed using Ansi procedures.

The Computer and Business Equipment Manufacturers Association (Cbema), which acts as secretariat to the X3 Information Processing Systems Committee, is handling distribution of the dictionary.

It costs $27 and can be obtained by writing to X3 Secretariat/Cbema, Suite 500, 311 First St. N.W., Washington, D.C. 20001.

With Improved Distributed Processing

Yankee Group Predicts Enhanced System/38

By Ed Scannell
CW Staff

BOSTON — IBM will bring out a high-end System/38 sometime during the third quarter that could have a performance rating as high as .8 million instructions per second (Mips).

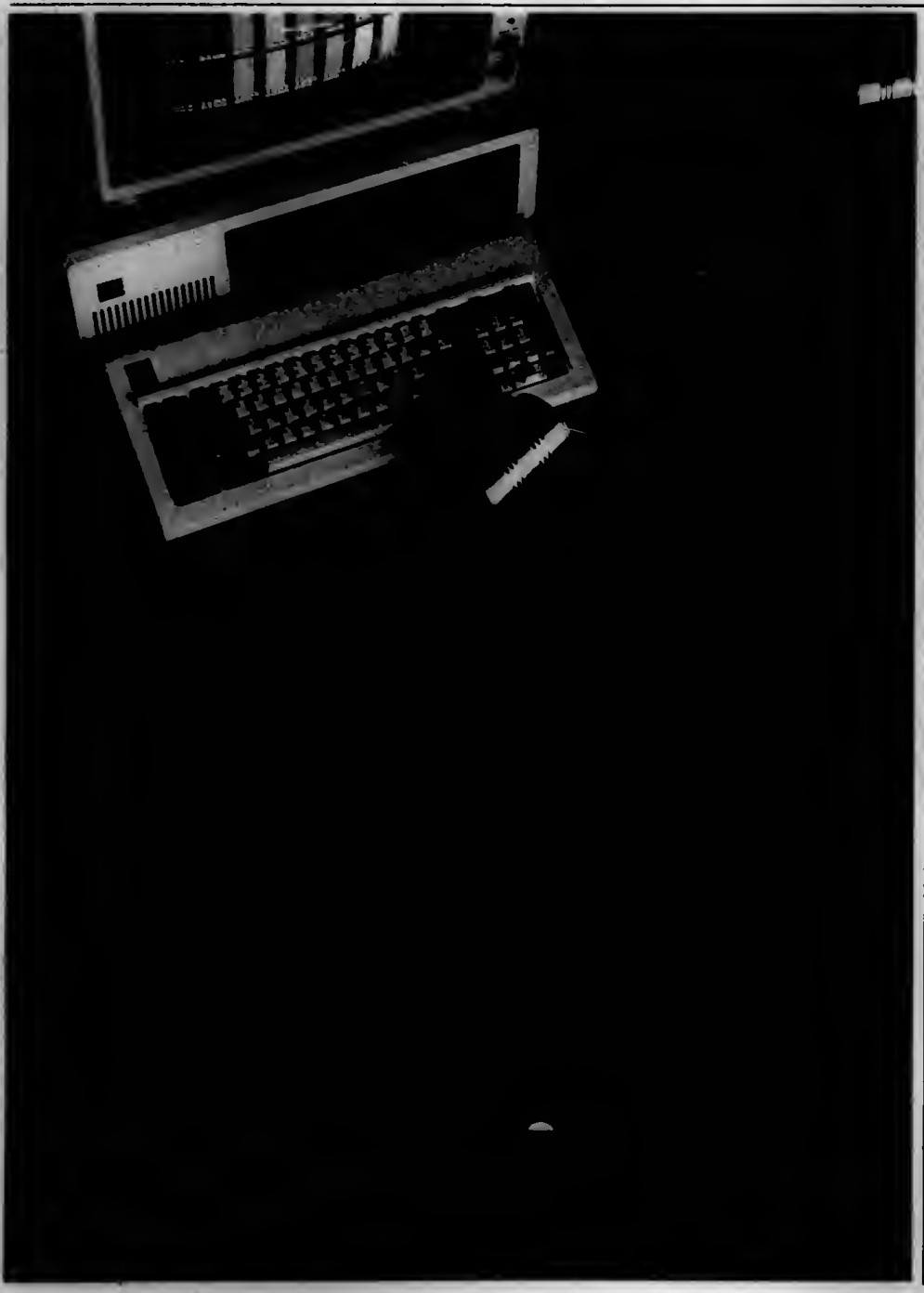
This forecast, along with predictions about IBM's future plans to enhance the distributed processing capabilities of its System/38s and its future 3270 strategy, was made by The Yankee Group, a marketing research firm here, in a three-part report entitled "Impact: IBM."

The report speculated that over the next two years, IBM will gradually improve the distributed processing capabilities of its System/38s by equipping them with enhanced Systems Network Architecture communications capabilities, a 3880-like disk controller/paging device, higher level languages, more efficient office automation software, improved terminal attachment, the ability to duplex systems and expanded business applications.

Significant price reductions on the System/38 series are also expected to be made, according to the report.

Of all these enhancements, the Model 9 with its superior processing speed will be the most significant, according to Yankee Group marketing analyst Frank Gens. "The higher end System/38s have a Mips rating of only .6 or .7; I expect the Model 9 to be at least .7 or .8," the marketing analyst maintained.

Gens said this added processing speed will be a necessity if the system is to handle adequately its added distributed processing responsibilities.



Terminal Strategy

The report contended that IBM's terminal strategy, particularly with the recently released 3178, will be to "flood the 3270 market" with generous price reductions and discounts that theoretically should increase the number of users.

With more users, the report concluded, there will also be an increased demand for disks, software and computing power that can only mean more advertising revenue for the Armonk giant.

Besides bringing in more revenue for the company, this "flooding" of the 3270 market places added pressure on competing minicomputer makers that are trying to position their systems downward into IBM environments, the report maintained.

The report also predicted that the hard disk-based XT will become the company's standard business microcomputer, relegating the floppy-based Personal Computer to home applications.

The Personal Computer will "probably be discontinued within the next 12 months," according to the report.

In addition, the much-rumored Peanut, which the study predicted will be available later this year, will most likely be an "intelligent keyboard" — for example, a stripped-down version of the Personal Computer that can be modularly upgraded.

The Peanut will essentially take the marketing niche now occupied by the Personal Computer, according to the report.

Finally, The Yankee Group said it expects IBM's newly formed Personal Computer Support System to be "significantly expanded in the near future," providing users with an electronic mail network through the company's Information Network.

The research firm contended that this facility will provide small business users with added processing power, sophisticated applications and various networking capabilities.

The three-part report costs $1,250, a spokesman for The Yankee Group said from 89 Broad St., 14th Floor, Boston, Mass. 02110.

Safeguards for Cryptographic Keys

NBS Scientists Get Patent on Security System

WASHINGTON, D.C. — Two computer scientists at the U.S. Commerce Department's National Bureau of Standards (NBS) are receiving a patent for a computer security system said to provide special safeguards for cryptographic keys used to scramble or unscramble computer data.

One way to protect the secrecy of data is to encipher or scramble the message so it can be read only by those who have the key to decipher it or convert it to its original form. The integrity of the data can be assured if the sender can add to the data a code that can detect a cryptographic error and be verified by the intended receiver who has the correct key, a department spokesman said.

Sealing the Key

The Key-Notarization System (KNS), developed by Miles E. Smid and Dennis K. Branstad of NBS' Institute for Computer Sciences and Technology (ICST), is said to protect data further by notarizing or sealing the key with the names of the transmitter and the intended receiver.

The notarization system uses the Data Encryption Standard, a cryptographic algorithm published by ICST as Federal Information Processing Standard 46.

Under KNS, the same key reportedly must be used to scramble and unscramble the information or to compute and verify the cryptographic integrity code.

Thus, only authorized transmitters can encipher the message, and only the intended receiver can decipher it.

No Fake Messages

In addition, neither party can fake a message or deny the authenticity of a message when the full capability of the KNS is used, a release said.

The KNS also makes it possible — by use of an agreed upon digital signature — for the receiver to prove to a third party that the message was sent by the transmitter, according to the release.

A U.S. patent number for "Cryptographic Key Notarization Methods and Apparatuses" will be issued soon, a spokesman said.

Nonexclusive licenses for manufacturing and using KNS are available from the Office of Government Inventions and Patents of the National Technical Information Service (NTIS).

The licenses cost $2,000 for the execution fee and 3% of net sales, according to an NTIS spokesman.

More information about licensing is available from George Kudravitz, NTIS, S285 Port Royal Road, Springfield, Va. 22161.

A list of ICST's computer security publications is also available from ICST, located at A209 Administration Building, NBS, Washington, D.C. 20234.

Software Show Set For Paris

PARIS — The First International Software Packages Exhibition will be held here from May 30 to June 1.

The show is being cosponsored by the Centre d'Experimentation des Progiciels (CXP) and Sicob, a major organizer of data processing exhibitions in Europe. It is said to be the first trade show in Europe to be completely dedicated to software packages.

The exhibition will take place in the Palais des Congres and will host 167 American and European exhibitors.

Further information about the conference can be obtained by contacting U3S Corp., Suite 300, 1801 Ave. of the Stars, Los Angeles, Calif. 90067.

Sicob is located at 4 et 6, Place de Valois, 75001 Paris, France. CXP is headquartered at 5 Rue de Monceau, 75008 Paris, France.

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Dr. W. LEE SHEVEL
Senior Vice President, Corporate Operations, Burroughs Corporation

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Can Top Dollar Ensure Best Work?

Turnaround Time
By Larry E. Long

Q **Our current costs for time-sharing services are in excess of $200,000 annually, so we've decided to move these services in-house. To help coordinate this effort, we have invited proposals from three consulting firms. I'm charged with evaluating the proposals and making a recommendation.**

The details contained in our request for proposals were very explicit. Consequently, the scope of each proposal is about the same. What differs is the price tag.

The low bid was a fixed price from one of our time-sharing services. The high side of the two Big Eight accounting firms' estimates were about double the fixed-price bid. With cost the major criterion, the obvious choice is to go with the time-sharing service. However, both Big Eight firms claim they have more experience in this area.

My boss is leaning toward the low bid even though he has not read the proposals. Any ideas?.

A Whenever you make cost the major criterion, you are asking for trouble. The cost of a service has no meaning unless it is weighed against the end product's anticipated level of quality.

A common pitfall in assessing the ability of a consulting firm to perform quality work is to put too much emphasis on the company. To be sure, a company's reputation should be considered, but remember, individuals, not companies, do the work.

Ask who will be assigned primary responsibility for the project. If you're going to pay top dollar for an "expert," make sure that the expert will be doing the work. If there is any question about who will be assigned to complete the project, get it in writing.

Talk with each of the proposed principals. Assess their experience, interest and the extent of their personal commitment to the project. Frank discussions with the people expected to do the work should give you some insight into the disparity in prices and the quality of the end product.

Q **After months of fruitless job hunting for a programming position, I gave up the idea of trying to work with DP equipment and started selling it. Therefore, to all those companies that would not even grant me the courtesy of an interview: I hope the hardware I'm going to sell you this year provides countless hours of unmitigated downtime, heartache and grief.**

A That's fine, but don't forget that there is a direct correlation between the level of customer satisfaction and the size of your commission.

Q **I interviewed with my present employer a year ago. I was offered $20,000 annually and a substantial pay increase six months later. I was also promised a six-month salary review in writing. I accepted the job offer based on these promises.**

Eight months ago, management commissioned a consulting firm to determine whether employee salaries were comparable with salaries in the "market." The results of the study were never released.

About the time of my promised salary review, the company issued a memo stating that the future was bleak and that there would be an across-the-board pay freeze.

I have an accounting degree and five years of DP experience. My question is this: What can a DP professional do to assure that promises made as part of a job offer are kept? Apparently, just "having it in writing" doesn't mean much any more. Is there anything I can do, other than taking legal action, to get what I was promised? Do you think I am underpaid?

A If the promise of a "substantial pay increase" was in writing, then perhaps you have some legal recourse. However, I suspect that this promise was made informally by an overzealous interviewer. Such written statements are extremely rare and usually accompanied by a very explicit condition of performance.

As for the promise of a six-month salary review, your company should go through the motions even though the pay freeze is in effect. This is just good management.

Being underpaid is relative to your worth on the open market. The only way to find out your real worth is to make yourself available to potential employers.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

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Dear David;

Computer Advice Columnist: David Jamison Carlyle

Dear David,

We've newly decided to make office automation, especially individual workstations, key in our growth plans. Right now, the issue seems to be video terminal equipment—which CRT, and from whom, *and* how to finance. Any suggestions?

Signed
Terminal Throes

Dear Term,

First, congratulations on the automation commitment! And, yes, I do have a suggestion, or rather, three—Lear Seigler, DJC and leasing.

For those workstation terminals, how about Lear Seigler video displays? One of the widest selections around plus high reliability and price performance have made Lear Seigler one of the finest names in the video terminal business.

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As for the source, DJC is a leading supplier of datacommunications and microcomputer equipment to today's corporations—and tomorrow's. They also offer flexible rental and leasing programs specifically designed to make this equipment available to DJC customers, whatever their financing and budget requirements.

Call DJC. They'll not only get you the Lear terminals, but also finance and network them! Now, that's the service a growing organization needs!

David

Dear David,

We have always leased our computer terminals and datacomm equipment. But with today's lower cost devices, we now sometimes rent and sometimes purchase. Most of the leasing companies specialize in financial alternatives, but know little about computers and communications, and their purchase prices are just not competitive.

What we need is one vendor we can work with regardless of whether we rent or buy—who can give us technical support and help us evaluate our exact hardware requirements. Isn't there someone around?

Signed
Lease-Lorn

Dear Lorn,

Yes, there is—DJC. At DJC you can rent, lease or buy the industry's broadest selection of equipment—including microcomputers—at some very competitive prices. And benefit from their expertise in understanding each device or network of equipment and how it answers a particular application problem.

You probably know DJC as a broad-line data/telecommunications company. But it is also a leasing company. That means that once selected, your optimum equipment mix enjoys optimum financing arrangements—rent, lease or purchase.

The communications needs of today's corporations pose a complex question, and flexible rent/lease programs are just part of the DJC response.

David

Dear David,

There are matrix printers all over this place, from companies I've never heard of, and apparently from companies with no visible means of service support. Can't I get price, speed, and high quality printing *and* service from someone I know and trust?

Signed,
Alternatives, Please

Dear Al,

Of course you can, if you call DJC and ask for Diablo.

Yes, Diablo (a Xerox company, you know), makes matrix. And with the same quality that made them number one in daisywheel printers. They've got a family of *six* matrix printers that do up to 400 cps with a print quality that's simply outstanding. Even with graphics and 'near-letter-quality' you've got one of the quietest families around! And when it's service time, you get the nationwide network of Xerox service centers. *That* is support.

Why don't you call DJC? They'll not only help you select the best mix of Diablo matrix for your company, but they can probably deliver them right out of their stock. After all, they are the country's leading distributor of data and telecommunications equipment.

David

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Send for DJC's terminal comparison chart.

Green Light for Manhattan Traffic

NYC to Battle Traffic Jams With On-Line Cops

By Bob Johnson
CW New York Bureau

NEW YORK — New York City, one of the most progressive municipal users of computers in the U.S., is calling on technology to battle its traffic problem in Manhattan.

Manhattan suffers from "grid lock," a situation that occurs when many traffic intersections become simultaneously blocked. This occurs because most of Manhattan's streets are laid out in a grid pattern. When traffic jams at one intersection, the overflow jams the next intersection as well.

The city's decision to use computers as traffic cops stems from two considerations, according to Commissioner of Traffic Samuel Schwartz. First, traffic signals in most of the city's other boroughs are already controlled on-line by a central CPU.

Second, the computer appears to be a natural tool to solve the grid lock problem that has plagued Manhattan for some time.

In theory, the grid lock problem is basically mathematical, involving cross sections of city arteries of a certain size and the amount of traffic that passes through them.

There are 2,700 signaled intersections in Manhattan that have to be monitored along with an enormous amount of daily traffic, according to Schwartz.

For this reason, the Manhattan Computerization Project was characterized by the commissioner as the most ambitious and complicated of its kind. "What has to be looked at is the density, volume and speed of traffic," he said.

"In order to avoid grid lock, we will, with the help of the new system, try to keep a functional speed level, make sure density is not too high and monitor the volume of traffic so we know who we are serving."

Two Traffic Studies

Two studies have been performed by Schwartz's department in an effort to employ the computer to alleviate grid lock. One of the studies involved the metering of high-density sectors; the other was a study of vehicles in motion (VIM). Schwartz explained that the metering study examined the densest street intersec- plus/minustions to determine how they should be monitored and what kind of action should be taken to prevent grid lock. The VIM study analyzed and measured factors such as vehicle speed so that a model for keeping traffic moving could be created.

The new system, expected to have traffic signals on-line by 1984 and be completed by 1986, will measure the speed, volume and density of traffic on city streets. This data will then be fed via coaxial cable through programmable control processors that will handle the data's routing functions, then travel through five on-line IBM 1800 controllers into the Traffic Department's central IBM 370/158 mainframe in Long Island City.

At that point, the system's Vehicular Traffic Control System (VTCS) software will take over, according to Lee Holmes, the Traffic Department's chief of signals and communications. The VTCS, which controls the signals in most of the other city boroughs, was developed by IBM, but has been enhanced with information supplied by the two traffic studies. The traffic package will address the traffic demands on the city streets, as well as implement anti-grid-lock strategies, Holmes pointed out.

"Some 1,600 copper coil inductance loop sensors will be placed six inches below the surface level of the city streets in 6-ft by 6-ft rectangles," Schwartz explained.

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WIP Told to Adapt, Apply Skill to Firm's Style

By Patricia Keefe
CW Staff

WALTHAM, Mass. — Women who want to get ahead in the computer industry should adapt themselves to the style and organization of their chosen company, according to Rose Ann Giordano, manager of Digital Equipment Corp.'s Large Computer Group.

Giordano spoke here recently before the Boston Forum of Women in Information Processing (WIP).

She is currently responsible for the management of all DEC 36-bit products sold worldwide in the $750,000 range and up.

Giordano has been in the industry for 15 years. Starting out at Bell Laboratories with a degree in mathematics, she went on to apend nine years at Xerox Corp. in its computer division in marketing, sales and systems management before joining DEC.

"I've been lucky. I've had fun and I think I've done reasonably well," she said. She told the audience that during her career she has never encountered sex discrimination.

'Belligerent Feminists'

Pledging her support for equal pay and equal opportunity issues, Giordano nonetheless warned that "belligerent" feminists "do more harm than good. They get lip service and are passed over," she warned.

Instead, women should decide what they want to do and go out and get those skills, applying them in their own style.

DP has been "a boon to women," according to Giordano.

She said she was "encouraged" by the fact that 25% of the exempt work force at DEC are women. Giordano noted that more than 50% of the people enrolled in the most recent sales training classes were women.

"There'a been just phenomenal growth here," she said, adding that women in sales are becoming commonplace.

Sales offers women visibility, the opportunity to run their own show, and "there'a no question whether you're competent," Giordano told the audience.

Few at Senior Level

Not so numerous, she conceded, are the number of women at the senior level. "Obviously, the statistics here are not that good, but it takes time," Giordano said, estimating that the number of top-level female executives at DEC was 4% to 5% of the total number of executives in the firm.

One reason for Giordano's ascent from marketing into management is her tenet that "he who proposes, does." At one point, when she criticized how something was being handled, she was told "if you're so smart, you do it."

She drafted a proposal that was accepted and suddenly found herself a manager who had to build an organization from the ground up within six months.

Faced with the prospect of hiring 50 people, Giordano sat down and determined the "critical factors of success" for her project.

She noted the areas where she was weak and made it a point to "hire people who could help attain those factors.

"People either hire in their own image or find people to complement their talents," she said.

For example, when Giordano, who had had no previous financial experience, realized her new position had endowed her with profit/loss responsibilities, she went out and hired a good controller.

Asked what women can do to get ahead, Giordano stressed the importance of education and training. She encouraged women with good, salable technical skills to consider forming their own ventures.

"There'a a lot of venture money out there," Giordano told the group.

For women whose strongest skills are nontechnical, Giordano pointed to personal computing and office automation as areas of potential growth.

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Computer Thieves Snagged With 'Radioactive' Hoax

SPRINGFIELD, Mass. — Thieves who recently stole some computer equipment from a moving van here found the goods were a little too hot to handle — or so they thought.

After the theft of about $28,000 worth of Compugraphic Corp. terminal equipment was discovered, a fast-thinking police officer here planted a street rumor that the equipment was "highly radioactive." A local newspaper cooperated by printing the bogus story.

The next day a woman notified the police that the cache of computer equipment had been abandoned on her back porch. The woman was able to identify one of the two men who abandoned the equipment, which was retrieved unharmed.

In addition, the department received "three or four calls from people wanting to know if they should come in for treatment," according to Alvin Correira, one of two detectives who investigated the case.

Willie Nero of Springfield was charged with receiving stolen property valued at over $100. Correira said more arrests were expected.

A spokesman said the planted story was an experiment police used because they believed the equipment was still in the city. "We figured they probably stole [the equipment] because they thought they could sell it on the street. But in fact it has no value except to businesses that can use it," Detective James Lash said. "We were afraid when they found out, they would just damage it."

Correira said the department would "absolutely try [the experiment] again. If you make the assumption that people are scared of computers and that they're not very sophisticated about these things in the first place, you can bet it will work again."

Courses Target Programmers Using IBM's IAG

NAPERVILLE, Ill. — Deltak, Inc. has announced three courses to aid experienced programmers develop IBM DMS/CICS/VS applications using IBM's Interactive Application Generator (IAG).

The three technical courses are part of an eight-part multimedia series called "DMS/CICS/VS Application Development." They were in conjunction with Duotech, Inc. and were designed for students who have a programming background in any language and a basic familiarity with IBM 3270 series display terminals.

The courses are applicable to OS/VS or DOS/VSE installations that use IBM's DMS to develop applications, according to a Deltak spokesman.

The first course, "The Interactive Application Generator," offers an overview of the IAG, including a discussion of utility maps and a definition for application development, Deltak said.

"Application Development Using IAG" considers development of complete applications using the IAG, including correct definition of a file and its data record, according to the vendor.

"Additional IAG Processing Options" is an extension of "Application Development Using IAG" and addresses communications fields, multiple files in processing, multiple page panels, sequential files and the DMS browsing features, Deltak said.

The courses cost from $50 to $125 per month or can be purchased for $1,750 per course, Deltak said from East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

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Suit, Additions Blamed for Missed Deadlines

By Patricia Keefe
CW Staff

McLEAN, Va. — Litigation that is "driving us crazy" and unending additions to its initial Medicaid Management Information System (MMIS) proposal are what an official of Systems Development Corp. (SDC) here called the primary reasons that SDC failed to meet two deadlines for the implementation of an MMIS in Massachusetts (story Page 33).

Electronic Data Systems Corp. (EDS) — an unsuccessful bidder for the contract that has filed a lawsuit against both SDC and the commonwealth of Massachusetts — "will continue this lawsuit forever, spending as much money as possible on it," SDC Services Group President Edward Doyle said in a recent telephone interview. Doyle contended that EDS' actions helped delay both the initial signing of a contract between SDC and the state as well as the subsequent required federal approval.

According to Doyle, after the state announced its decision to award the MMIS contract to SDC, EDS charge that some of the features outlined in the winning bid, which were based on SDC's MMIS implementation in Florida, did not exist. Massachusetts officials organized and sent a special committee to Florida to examine that state's MMIS software and speak with Florida officials about the SDC-developed system. Upon their return, committee members submitted a report to the Massachusetts governor's office "that proved we were right and EDS was wrong," Doyle said.

When the contract between Massachusetts and SDC was finally signed in September, after a two-month delay while EDS, charges were checked out, work under the contract was hampered by a front-page clause that declared the contract "useless as long as it was not approved by federal officials," Doyle said. While federal approval is ordinarily little more than a formality, the SDC executive charged that because EDS took its story to federal officials, who then checked SDC, formal approval of the contract did not come until last Dec. 8. It was this delay of the delivery of a certified contract that most severely hampered SDC's efforts to meet its first deadline for MMIS, Dolye said.

EDS' next move, according to Doyle, was to charge collusion between SDC and the state. When a probe instigated by the Massachusetts Attorney General's office rejected EDS' charges, EDS filed suit against the state.

"We asked to be included as defendants in the suit because states usually don't have the legal resources to fight these things," Doyle said, charging that EDS "tries to intimidate" states in this manner.

Responding to EDS' charge that SDC offered a job to a state employee, Doyle said the employee answered a newspaper advertisement but was not offered a job.

SDC failed to meet the March 31 extended deadline for MMIS implementation because of the "hundreds of changes" made to the baseline system by the state, Doyle said.

Doyle also complained that the state's policy of having an outside group test each subsystem is "stringing out" the testing period.

Mass. System Includes Manual DP

BOSTON — Although it is trying to implement a Medicaid Management Information System (MMIS), Massachusetts does not rely solely on automated processing of its estimated 17 million Medicaid claims each year.

Processing efforts are divided between manual and automated methods. The state Medicaid office, which operates under the auspices of the Public Welfare Department, divides the processing of Medicaid claims between two subcontractors and the state's own internal computer system, overseen by the Office of Management Information Systems.

The Medicaid processing is done on several computer systems that are incompatible, according to a welfare department spokeswoman. As a result, each system can only do part of a job. The commonwealth's portion of Medicaid processing is run on an IBM 3033 and a minicomputer.

Massachusetts handles its own data entry. The Medicaid office has a facility in Westboro, Mass., which primarily handles the manual processing of hard copy on about 45 data entry terminals.

Subcontractors include Blue Cross/Blue Shield of Massachusetts, which handles Medicaid/Medicare crossovers, and Pilgrim Health Applications, Inc., which handles pharmaceutical, dental and medical service billings.

The current system, which Steve Buchner, contract administrator for the MMIS project, described as "patchworked," runs 10-year-old software. The present MMIS contractor, Systems Development Corp., has contracted to provide Massachusetts with a certified base system, taken from its similar Florida operation and customized for the commonwealth.

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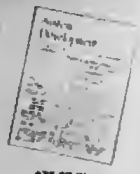

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Could Lose 25% of Reimbursements

Mass. Medicaid Management System Stymied

By Patricia Keefe
CW Staff

BOSTON — The six-year effort to implement a Medicaid Management Information System (MMIS) in Massachusetts has been stymied again, this time by missed project deadlines and an unsuccessful bidder's lawsuit.

According to Massachusetts officials, MMIS contractor Systems Development Corp. (SDC) is not only having trouble meeting its deadlines but — along with the commonwealth itself — is being sued by Electronic Data Systems Corp. The suit, which alleges that irregularities took place during the bid selection process, has prompted a state Ethics Commission probe.

These snafus could impact federal reimbursement for administrative costs generated under Medicaid. It could also hamstring recently elected Gov. Michael S. Dukakis' attempts to balance his proposed budget for the next fiscal year.

Incorporated into that budget are projected direct savings of $6.7 million that would be realized from an operating MMIS.

A spokeswoman for the Massachusetts Department of Public Welfare said "there is a great deal of dissatisfaction with SDC." The state was supposed to have its MMIS up and running on March 31.

The Department of Public Welfare, which administers the Medicaid program, has asked the U.S. Department of Health and Human Services (HHS) to waive penalties that could be assessed against the state under the so-called Schweiker Amendment for the delay in implementing MMIS. The state expects an answer to its request within two weeks.

If its request is denied, the commonwealth stands to lose at least 10% and potentially up to 25% of administrative reimbursement funds provided by the federal government until an acceptable computer system is up and running.

If the state is fined, it probably will fine SDC in turn, Assistant Welfare Commissioner for Medicaid Dennis Beatrice said.

The penalties could cost the state $2.4 million by the end of the year, estimated Alfred Fuoroli, regional associate administrator for the Healthcare Finance Office of the HHS. The projected $2.4 million loss is in addition to the $1 million per month that critics estimate Massachusetts is already losing because of its failure to implement MMIS.

That failure is not due to a lack of trying. Since 1977, the commonwealth has awarded three contracts to streamline the automation of its Medicaid claims processing. Two of those contracts were canceled.

A bidding dispute in 1977 resulted in the withdrawal of a contract award to Blue Cross/Blue Shield of Massachusetts and consequent contracting with Pilgrim Health Applications, Inc. in 1978. Two years later, Pilgrim was fired — the result of an "amicable agreement" — for failure to meet its deadlines [CW, April 21, 1980].

The current MMIS project undertaken by SDC has been delayed almost from the start, when the signing of the contract was held up for several months while the state examined charges of collusion between SDC and state employees. The state attorney general's office eventually ruled that an offer of employment made by SDC to one Welfare Department employee, which was not accepted, did not constitute conflict of interest.

SDC's four-year contract, which has an option for two more years, could net SDC up to $75 million, according to contract administrator Steve Buchner. It covers the processing of approximately 17 million Medicaid claims totaling about $1 billion, at 42.5 cents per claim for the first year.

Federal officials, wary of the commonwealth's past history in automating Medicaid, inserted a clause into its contract for system implementation reimbursement with Massachusetts that will allow the U.S. government to recoup its entire investment if the project fails to get off the ground, according to Fuoroli.

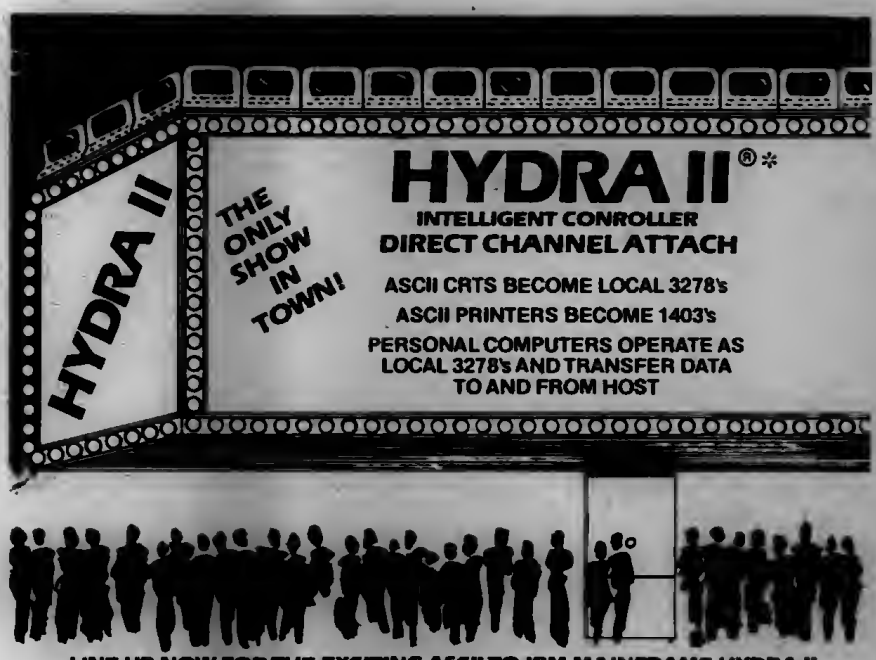
MIC Report Evaluates Lisa

CHERRY HILL, N.J. — Management Information Corp. (MIC) has presented what it calls a "thoroughly objective evaluation" of Apple Computer, Inc.'s Lisa microcomputer in its April edition of "Officemation Products Reports."

The 19-page report evaluates Lisa and compares it with Xerox Corp.'s Star, IBM's XT and Digital Equipment Corp.'s Professional 350, according to the vendor.

The report on Lisa can be obtained either by subscribing to MIC's "Officemation Product Reports" ($295/year) or purchasing a single copy of the report for $35.

MIC is located at 140 Barclay Center, Cherry Hill, N.J. 08034.



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Using Superminis, Minis, Micros

Airline Steers Its Own Distributed System

DENVER — The DP department of an airline here is hoping the old saying about the third time being a charm will hold true for its new system, which is currently under development. Instead of utilizing big mainframe processors, the airline's system uses superminicomputers, minicomputers and microcomputers in a distributed system that will eventually link the host processors here with smaller systems in 80 airports.

Frontier Airlines has something of a checkered past when it comes to computer systems. Back in 1968, the firm had three IBM 360 processors and was one of the first users of IBM's Programmed Airlines Reservation System. Two years later, there was a management shake-up at Frontier.

The new management decided Frontier was spending far too much on computing and ordered the 360 systems scrapped. At that point, Frontier started doing its data processing through a service bureau, according to Lowell R. Shirley, Frontier's senior director of information services.

Eleven years later the airline had become more financially secure. The government had deregulated airline travel, and the data processing work load had increased tenfold. Once again, Frontier decided it needed its own computer system.

But this time things were going to be different. The firm decided to build a network of IBM System/38 processors, Series/1 minicomputers and Personal Computers.

Shirley said that when he came to Frontier from Bechtel Corp. in the summer of 1981, his first task was to find out exactly what condition the existing information system was in and how it was perceived by the user divisions.

Not Economical

Based on a consultant's evaluation conducted in early 1981, Shirley determined that the airline's reservations system, which was leased from Continental Computer Services (a division of Continental Airlines), was adequate. He decided it was probably most economical to continue sharing the reservations system with Continental.

A further review of Frontier's DP needs, Shirley recalled, revealed about 95% of the data used at Frontier was generated in-house. The remaining 5% came from outside sources like the Federal Aviation Administration (FAA).

Shirley also determined that only 5% of all the firm's data had to be in a real-time mode. That meant 95% of Frontier's data could be updated by the close of the next business day and still be considered timely.

In devising a system to meet its needs, Frontier decided to develop most of the software for its new system in-house. Shirley said this decision was made because all of the commercial airlines software packages on the market were developed for other airlines and would have to be revised to meet Frontier's needs. To modify the programs would have taken as much time as simply developing a new, specialized package, Shirley maintained. However, some financial packages were purchased and integrated into the system, he added.

Shirley recommended the System/38 because he had used the processor while at Bechtel, where he was manager of software development. At Frontier, Shirley's strategy was to develop a central processing system of multiple System/38s capable of transferring data between machines. Frontier currently has three System/38 Model 7 processors installed with a fourth Model 8 processor scheduled for delivery in about six months.

Not Without Risk

But the decision to use System/38 is not without risk. Shirley noted that based on his experience at Bechtel, the System/38 can be a great boon to productivity. However, he is still concerned whether IBM will announce hardware and communications enhancements to System/38 fast enough to keep up with Frontier's needs.

"So far, IBM has provided what we need as fast as we could use it. Our risks appear to have been worthwhile," Shirley said.

With the System/38 processors installed at Frontier's corporate headquarters here, the next step in Shirley's information services strategy is, he said, to provide DP services to the 80 airports Frontier serves.

Since Frontier had already decided to keep the reservations system separate from the DP system, Shirley said, there is no real need to bring information generated at the 80 airports back here for processing. Instead, Frontier plans to build a network of IBM Series/1 minicomputers located at each of the major airports to process data.

At the heart of the network is a group of Series/1 processors and specialized message-switching software developed by Systar Corp. The group of Series/1s will also provide data concentration for exchanging information with the Continental reservations system and provide a link to other processors such as the host processors at the FAA. Installation of the Series/1 processors is expected to begin in August or September.

The final step in the Frontier system is to incorporate microcomputers — IBM Personal Computers — into the System/38 network.

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Moving to Bundled Packages

Micros Seen Impacting Graphics

By Patricia Keefe
CW Staff

TARPON SPRINGS, Fla. — Microcomputers are having a large impact on the business graphics market and changing the profile of graphics users, according to Deborah Kelly, manager of computer graphics research for International Data Corp.'s (IDC) Los Angeles office.

Kelly spoke here recently at a focus group on office graphics at IDC's 14th Spring Executive Conference.

Presenting a recently completed IDC study, she predicted that the business graphics market as it is known today is likely to disappear as vendors increasingly integrate graphics into bundled packages.

According to the study, graphics use and productivity were found to increase after the installation of a business graphics system. At least 36% of those users with increased use found they needed more system capacity, and 90% plan to purchase more graphics software and hardware over the next two years, Kelly said.

The use of microcomputers to create business graphics has risen sharply, with 40% of the users falling in that category. Microcomputer use is gaining fast on the use of general-purpose host systems; only 48% of the respondents took that route, she added.

These results indicate a shift in business graphics use since 1979, according to Kelly. For example, a similar study completed in 1980 found that 75% of business graphics users were from large firms. In addition, sales presentations were cited as the primary use for graphics.

This is no longer true, Kelly said. Fifty-one percent of the users in the 1983 study were from small companies. Between 80% and 90% of users overall reported that more managers are using business graphics as a form of decision support for forecasting, planning and business analysis.

But those managers are not always the creators of the business graphics they use. "Vendors need to pay more attention to designing systems that nontechnical managers can use," Kelly said.

The ideal package should be interactive and provide direct access to the company's main data base, she added. Direct access is currently most pervasive at sites where business graphics systems are run on a mainframe or minicomputer (60% of users), Kelly said.

However, as more and more graphics packages are designed for microcomputers, Kelly expects to see more access to mainframe-based information for the microcomputer user.

User perception of the importance of ease of use and flexibility has increased since 1980, Kelly said. "Users want their systems to do more," she added.

While the use of color has increased, users are generally willing to trade off many colors for lower cost, according to Kelly.

Major trends in store for the business graphics market, according to Kelly, include standardized formats, micro emphasis, improved ease of use, better data base access and more and better low-cost color.

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N.J. School Board Makes the Grade With System

TRENTON, N.J. — An integrated information system that combines data and word processing functions has saved the New Jersey School Boards Association (NJSBA) $12,000 per year in service bureau costs.

In addition, the system has expanded services to members, improved office staff productivity and allowed the group to draw on all of its data bases to generate personalized letters, notices and reports.

"We are doing things we never dreamed of before," Dr. Frank Steffero, assistant director of the association's Management Information Department, said.

Like other state school board associations, the NJSBA has a twofold mandate: to speak out for the interests of schools and students and to supply the information that board members need to oversee their districts.

Since the early '70s, the group had used service bureaus to compile statistical reports, maintain its membership list and produce mailing labels. "I could tell you some real horror stories about that," Steffero explained.

Need for Flexibility

Then in 1975, two IBM mag card typewriters were brought in to process paperwork for the Legal and Governmental Relations Department. These moves toward automation, helpful as they were, still did not give the group the flexibility it needed.

For example, even small batches of mailing labels required a two-day wait. "That didn't make our lobbyists very happy," Steffero said, "because for an urgent legislative notice, we'd need to get mailings out within hours of the time an issue became important."

Such drawbacks prompted a review of the NJSBA's data and word processing needs. In 1979, Steffero undertook a study of available equipment that would combine both functions in one system, use the vendor's own word processing software and cost under $100,000.

As it turned out, only one such system was available in 1979 — the Wang Laboratories, Inc. VS computer. "We kept asking for a system that would let us move our data back and forth easily, but all the other vendors said, 'We'll have it next year,'" Steffero said. The other vendors included IBM, Digital Equipment Corp., Burroughs Corp., NCR Corp., Micom Systems, Inc. and A.B. Dick Co.

So in 1980, the association purchased a VS 80 with 256K bytes of main memory, a 90M-byte disk storage device, a diskette drive and communications capabilities.

Two word processing workstations and one data processing workstation, a 40 char./sec, letter-quality daisywheel printer and a 600 line/min draft printer were part of the original system. To date, three more workstations and a second daisywheel printer have been added.

The group also installed a Wang Word Processor System 20 with two CRT terminals and a 40 char./sec daisywheel printer at its headquarters, a short distance away from the office building that houses the VS.

The group's central data base is its Membership System, containing the names and addresses of 5,000 board members from the state's 611 school districts, along with pertinent information such as terms of office.

Names and addresses of legislators and other key decision makers in the field of education are also included.

NJSBA now has complete control over its mailings. "We have about 10,000 names and we've designed the system so that an authorized employee can select by choosing from a series of menus on the screen," Steffero explained.

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Oil Firm's System Drills for Profits at Well Sites

BARTLESVILLE, Okla. — The complex process of evaluating the profitability of prospective drill sites is nothing new to Phillips Petroleum Co.

Since the oil company integrated computers into its evaluations and forecasts, the process has been streamlined considerably. And since the company installed Cincom Systems, Inc.'s Series 80 Mantis application development system 2½ years ago, geologists and engineers at Phillips report that analysis and calculations that previously took four to eight hours to do are now completed in 15 minutes.

Detailed, accurate projections of well production are needed for internal decision making, as well as for reports to the U.S. Securities and Exchange Commission, noted Bob Hindman, project director at the company's headquarters here.

"The need to automate the forecasting procedures with an interactive, on-line system had been obvious for some time," Hindman said. "But before Mantis became available, we had not even attempted the applications because conventional methods such as command-level CICS or IMS were too cumbersome and consumed too much of the data processing resources."

According to Murphy Canon, senior systems specialist at Phillips, the firm looked at about 12 packages and decided on the Mantis system for its interactive programming capability, screen design and filter definition.

For end users, the Mantis system brought about important improvements, Robert Hite, senior evaluation specialist for the company, said.

"The Mantis system has made it possible for us to have instant answers to questions about whether to drill at a particular location," Hite said. "Before Mantis, I had to wait for batch reports — which meant a four- to five-hour delay. With Mantis, I enter new data and get immediate results based on the updated information."

Tony Canfield, an engineer in Phillips' Houston office, also praised the system.

"Before Mantis, I often spent half a day gathering information before I could even do a decline curve analysis to forecast well production," Canfield said. "With Mantis, access to the data is immediate, and even generating the curve is automatic through an in-house developed graphics system. In less than 15 minutes, I have the completed analysis."

Development Team

The Mantis system has also proved helpful for the Phillips development team, which combines DP and non-DP professionals working together to build applications.

"One of the problems we faced in getting applications into the hands of the users was the lack of programmers experienced in developing on-line, interactive applications," Hindman explained. "Mantis enables us to improve the overall productivity of our programming staff by 200% to 300%, compared with using traditional programming languages.

"Mantis is also versatile," Hindman added. "It can be used for scientific and technical applications as well as business applications. This was important for the acceptance of technical people who are traditionally oriented to languages like PL/I and Fortran."

Phillips' reserve/production forecasting system utilizes graphics developed in-house using Mantis to plot decline curves. The curves are based on historical data and the engineer's best judgment forecast of the volume of remaining reserves yet to be recovered, the yearly production volume and the life of a well or lease.

"Our users are extremely pleased with the systems developed using Mantis," Hindman said. "And from DP's point of view, Mantis has provided important productivity improvements, as well as other benefits, including a high level of support from users, a results-oriented approach to solving problems, a highly flexible system and ease of response to change."

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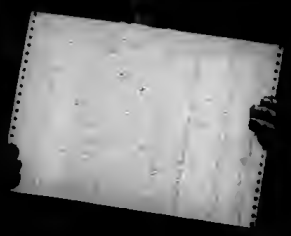

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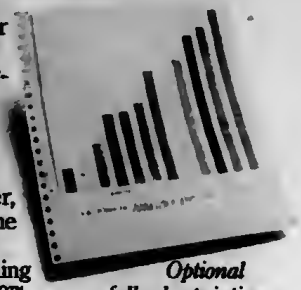

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Ease of Use Important, Too

System's Cost Bottom Line of Firm's Choice

MONTERREY, Mexico — Time-sharing capability and ease of use were important. But a saving on the bottom line was the chief requirement when Valores Industriales SA here was selecting its computer system.

Encompassing several companies organized into five divisions, Valores Industriales is considered one of Mexico's largest corporations, with 37,000 employees.

The company's largest division is Cerveceria Cuauhtemoc, SA (CCSA), a brewery founded in 1890. Today, CCSA produces 264 million gallons of beer annually. Most familiar to the U.S. are Carta Blanca and Bohemia.

Other operations include a fast-food chain; a soft drink division; a beef, poultry and fish division; a packaging division; and a tourism group.

Five years ago, Valores Industriales developed a hierarchical data base system with color graphics and 82 applications.

Planning for the corporate computer system began in early 1978, with a detailed analysis defining policies, user requirements, equipment configurations and performance objectives.

After evaluating several systems, the company narrowed it down to a choice between Digital Equipment Corp.'s Decsystem-2060 or IBM's 4341.

"The main criteria for selection were system cost, time-sharing capability, peripheral control, ability to interchange information and applications with other [Valores Industriales] computers, personnel training required and vendor support," commented Jose Luis Torres, DP planning manager for Valores.

"The price difference between the two systems was about $80,000 in favor of DEC," Torres said. "We finally selected the DEC system because of time-sharing capability, system simplicity and ease of operation."

The Decsystem-20 mainframe was installed in late 1978. The configuration consists of a Decsystem-2060, with 10M bytes of main memory, two 900 line/min printers and two TU77 tape transports.

Software for the system includes DEC's Tops-20 operating system, DBMS-20, APL, Fortran, Cobol, Basic and several graphics packages. The company also bought Sistemas de Informacion (Sisinf), a Spanish hierarchical data base procedural language from Kratos SA in Monterrey, Nuevo Leon, Mexico.

"Sisinf is an elegantly simple language, in Spanish, which is designed to improve productivity," noted Francisco Javier Martinez, Valores systems planning co-commands, such as Enter, Delete, Change, Display, Summarize and Cost Schedule, that are easy to learn and greatly simplify programming."

Sisinf Over Cobol

Martinez said he has observed a sevenfold increase in program development productivity and a tenfold increase in program maintenance using Sisinf over Cobol.

A large portion of the Decsystem-2060's data base is devoted to personnel records on Valores' 37,000 employees. Forty-two human and industrial relations applications are in effect with 18 more planned. For human resources planning, the applications include plant organizations, personnel balances, cost-of-living and wage analyses, labor forecasts, labor/social environment infrastructure, labor cost analyses and records of industrial accidents.

"We are quite pleased with the Decsystem-20," Torres said. "We started with a three-year plan and after just two [years], it was 95% complete. We have since undertaken additional tasks that we couldn't envision when we first started."

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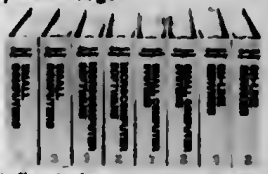

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Ability to Inspire People Cited

Speaker Lists Ingredients of Leadership, Success

CW Photo by M. Zientara

Terry W. Mullins

By Marguerite Zientara
CW Staff

BOSTON — Leadership is "the ability to inspire people to want to join you in a common purpose to achieve something special," and nowhere is it more valuable than in a business setting.

That was the word recently from Terry W. Mullins, associate professor of business administration at the University of North Carolina-Greensboro, speaking on "Leadership Through Motivation" at the annual conference of the Association for Systems Management.

"Individuals' purposes are incongruent with an organization's, and people behave in intermittent and individual ways," Mullins noted. Keeping employees motivated calls not only for leadership, but also supervision, a "necessary ingredient of, but not a substitute for, leadership," he said.

In excellent companies, managers "care greatly about what they do and do it with zeal," Mullins said. "Top management is rigid regarding what it considers important."

Recruit Carefully

Another ingredient of success is that "recruiting is handled extremely carefully," he noted. "You can help or hurt yourself in personnel selection more quickly than in any other area.

"If you select well and motivate and lead properly, an organization almost can't be beat," he added.

Worker performance is a function of two variables — motivation and ability — Mullins noted. "Ability is affected by training, while motivation is affected by supervision and leadership," he said.

Expectancy Models

Why do some workers produce more than others? "Employees use expectancy models to calculate the payoff of working hard or of coasting," Mullins said. First, they ask themselves, "Will effort on my part lead to high performance?" If the answer is no, they are not likely to try to perform.

Second, they ask themselves, "Do I have the knowledge and skills necessary for the tasks at hand?" If the work is carefully planned and they can go through and do it, workers are more likely to try.

Third, workers ask themselves, "Will performance lead to a reward?" and "Will the payoff be meaningful to me?" A manager "can't give a reward to someone unless that person regards it as a reward," Mullins pointed out. Possible rewards include additional pay, promotion, praise, new decor, business trips and time off.

Minimize Punishment

Managers should minimize punishment in the work environment, Mullins advised. "Punishment has a very devastating effect on people's productivity," he said. "If you use punishment, make it a fatal blow or don't use it at all."

There are also personal variables that enter into motivation, he added, such as the need for personal growth, competence, achievement, learning and for being regarded as responsible.

To have good direct supervision, one must set unmistakable goals, supervise the work more than the worker, distinguish between essential and nonessential rules and reward and punish sparingly.

In addition, a manager must give credit where it is due; listen to complaints patiently, "but don't complain in return"; pay respect to the organization's values; protect subordinates; and retain control over expenditures and personnel actions.

A manager should also "innovate democratically" and "take infinite pains" to maintain a high level of performance.

Good indirect supervision calls for a manager to "find and hold the purse strings," develop detailed plans and projections, know what is going on at the lower levels of the organization, reorganize drastically or not at all and respect successful operations.

"A good leader knows success is built on previous mistakes and that people can't learn without making mistakes," Mullina pointed out. Good leaders also give help only when asked and create opportunities for successful experiences, he added.

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Supply House Opts for Off-Site DP Service

FAIRVIEW, N.J. — A plumbing supply wholesaler here automated its accounting and management procedures by going to an on-line, off-site service after encountering "two years of programming frustrations" with an in-house computer.

The Palermo Plumbing Supply Co. (PPSC) employs a staff of 59 in a showroom-oriented, two-location plumbing and warehouse operation. The company occupies building space of over 50,000 sq ft, has an inventory of about 15,000 different items and services more than 2,350 customers. As its business grew, PPSC decided to "get away from the 'Mom and Pop' candy store kind of accounting and management" and automate, according to Tom Palermo, its controller.

But PPSC was apprehensive about having its business records stored off-site. For that reason, the company opted for an in-house system, even though it had no DP experience. After researching various computer systems, PPSC installed an NCR Corp. 8200 minicomputer in 1979 to facilitate its cash flow and records management.

A year later, the only automated program in operation was accounts receivable; invoicing was still being handled manually. The software programmer, an independent contractor, was seldom available to write programs.

After a year and a half, the system generated only invoices and statements.

Two Different Businesses

"After we bought a computer, we ended up being in two businesses — the computer business and the plumbing supply business," Palermo said. Besides forcing the company to suffer through two years of "culture shock" with the "new disciplines" required by the computer, the system took too much time away from the primary business, he added.

In the end, PPSC learned an "expensive" lesson: "Never buy an on-site computer system that doesn't have proven programming that you can use immediately," Palermo said.

In the midst of these problems, in January 1981, PPSC received a call from Terminal Applications Group, Inc. (TAG) of Scarsdale, N.Y., developers of business-oriented applications programs for plumbing and heating supply and other wholesale inventory-oriented applications. TAG offered the option of renting, leasing or purchasing hardware and software; a five-year pricing guarantee; a Life-Line support staff that it claimed can resolve problems in less than three minutes; and free computer time.

Impressed by what it saw, PPSC contracted with TAG in June. "One of the joys of TAG," according to Palermo, "is that PPSC doesn't need an on-site computer — or have to deal with the equipment, personnel and downtime that go along with it."

Instead, PPSC has three workstations at its two locations functioning as an inquiry and retrieval system. Each TAG workstation is comprised of a desktop CRT display with keyboard, a high-speed printer and a modem link to TAG's NCR 8500 mainframe through regular telephone lines.

The workstation operators were trained in two days, Palermo said. Moreover, "within one month on TAG, we surpassed two years of our in-house computer system's output, successfully automating invoicing, pricing and statements and accounts receivable."

Real-Time Response

By October, TAG had PPSC's accounts payable and most of its general ledger on-line with real-time response to inquiries. "We are also able to determine which portion of our revenues are derived from parts, showroom sales, phone or mail orders," Palermo noted.

TAG adopted Plumlee's Pricing System in February 1982, which lists parts, styles, models, colors and pricing for various manufacturers' products in its data base.

"The TAG system has saved us a lot of money — compared to the NCR system — by eliminating the need for our developing and debugging a multitude of software programs; hiring programmers and additional personnel — despite a steady increase in business; and eliminating the need for nursing an expensive-to-buy-or-lease computer," Palmero said.

Happy with what it calls the computer alternative, PPSC did pack away its NCR 8200 — it donated it to the Paramus (N.J.) Catholic High School.

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Urisa Conference to Focus On Decision Support Systems

ATLANTA — "Decision Support Systems for Policy and Management" is the theme of the Urban and Regional Information Systems Association (Urisa) 21st annual conference, slated to take place here Aug. 14-17.

The aim of this year's conference is to encourage agencies to share their experiences, observations and apprehensions in the use of computer technology in support of decision making at the federal, state and local levels, according to an Urisa spokesman.

The 40 scheduled sessions will focus on geographic information systems, public works, natural resources, finance and new technologies.

Preconference workshops will include: "Getting Started in Local Government Data Processing," "Computer Graphics in Local Government," "Microcomputers" and "Geoprocessing and Data Base Management," according to an Urisa spokesman.

Registration for this conference costs $190 for members and $240 for others.

Further details may be obtained from Urisa headquarters, which is located at Suite 506, 4720 Montgomery Lane, Bethesda, Md. 20814.

Package Helps Money Talk At U.S. Language School

PRINCETON, N.J. — Languages are not the only thing translated by the Berlitz School of Languages of America. Its DP department based here also has to translate financial data submitted by the school's 218 branches located in 22 countries in four continents.

In 1981, the school began looking for a financial package for its Hewlett-Packard Co. HP 3000 Series 3 minicomputer. One of the more unique requirements was that it should be able to perform currency conversions efficiently from the data that flowed into the DP department nightly from around the globe.

Robert Long, Berlitz's management information systems director, examined the market offerings, finding three or four financial packages tailored for the HP 3000. But one in particular, GL/Plus from McCormack & Dodge Corp., claimed to offer the currency translation capabilities Berlitz demanded, and that is the package Long bought.

"It's an excellent package that has met all our needs so far," Long said. "It is reasonably efficient from a processing standpoint, too."

Financial information is gathered from Berlitz's national and international sources using a store-and-forward communications link with RCA Global Communications, Inc., Long said. Each international entity prepares trial-balance and profit-and-loss statements in local currency, then transmits the statements to RCA's communications service. Berlitz then summons the statements with its HP 125 microcomputers, finally transferring them to the HP 3000.

Detail information from the international locations then follows the normal GL/Plus processing cycle through the acceptance and editing programs.

"Batches of local currency details by country are processed by the translation and validation programs of GL/Plus," Long explained. "Valid batches are accumulated in an accepted journals work file, while erroneous batches are sent to the error recycle file. At the end of the accepted journals program, we interrupt the job stream and hold the details on a work file. As the information comes in, the accountants do multiple repetitions of the accept or reject procedure."

Accurate Detail

The end result is accurate financial detail in local currency from all international sources ready to be posted to the GL/Plus master file. To facilitate the conversion process, Berlitz wrote a program to extract the local currency balances from the master file and feed them back through the GL translator, which uses a currency conversion factor allowing currency rates to be applied.

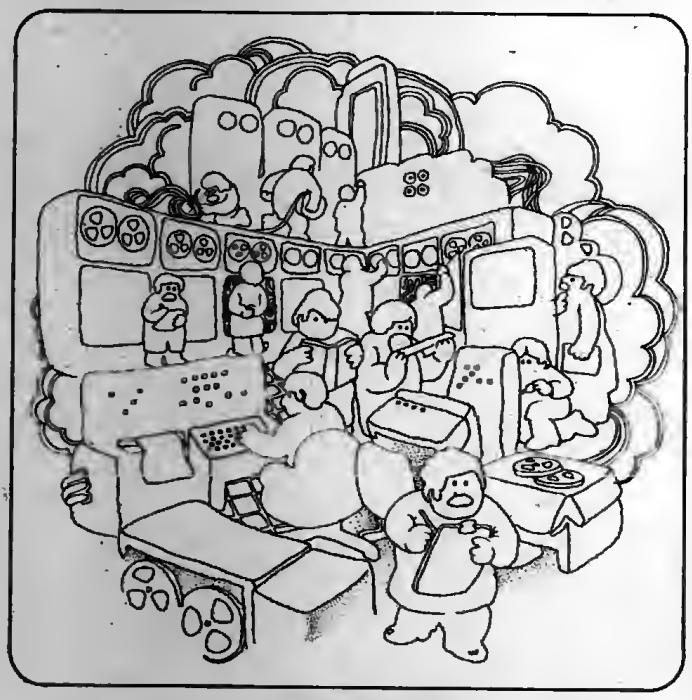
"Because we are extracting amounts from the master file, we are pretty sure everything will balance," Long said. "The job stream translates, extracts, validates, posts and reports consolidated results in U.S. dollars after three or four hours of processing."

Prior to closing the cycle, Berlitz runs a reversal cycle to zero out balance sheet totals and enter the previous month's year-to-date reversed balances of profit-and-loss accounts. This month's activity is entered as year-to-date balances, with the two entries producing the net current month activity, Long explained.

As for the future, Long said he foresees the expansion of Berlitz's automated financial systems to other countries.

Berlitz will further be using microcomputers in its individual schools for school accounting, all of which will require updating communications capabilities.

when programming is not enough . . .



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Cargo Shipping Firm Stays Afloat With Micros

ELIZABETH, N.J. — How do you keep a worldwide cargo shipping firm afloat when it has vessels that visit more than 180 ports and cities in 56 countries? You use a fleet of microcomputers, of course, that keep track of the maritime comings and goings.

In all, Sea-Land Service, Inc. ships more than 650,000 container loads of cargo each year. Two years ago, the firm decided that a network of microcomputers could be used in conjunction with its IBM 3033 mainframe to cut costs and to speed up the processing of paperwork for regulatory agencies and the firm's international offices.

One of the most critical operations involved developing, publishing and applying ocean tariffs. According to the firm's manager of tariff and rating systems, Jeffrey W. LeRose, tariffs are documents that set the rates for point-to-point cargo movements. The tariffs also contain the rules and additional charges, if any, for moving cargo.

LeRose explained that tariffs can range in size from a few pages to better than 500 pages in length. The forms used to be typed on a typewriter, then photocopied and forwarded, either by mail or courier, to the Federal Maritime Commission (FMC) or the Interstate Commerce Commission (ICC) for filing, according to LeRose.

Decided to Automate

The manual system used by Sea-Land was getting expensive and complex. In light of the rising costs involved, LeRose said Sea-Land decided to automate the process.

Begun in 1980, the project was implemented in several phases. The first phase, LeRose explained, was to develop an automated system to prepare and file tariffs. The initial step was to install a word processing system. Sea-Land adopted a specialized tariff system developed by Computerized Shipping Services, Inc., based in Beaverton, Ore.

The original system consisted of of an Onyx Distribution, Inc. microcomputer that controlled eight Zenith Data Systems Corp. Z89 micros, each with two Printronix, Inc. printers. Computerized Shipping Services provided the FMC and ICC with printers and modems in Washington, D.C., to allow both organizations to receive tariff pages for filing, LeRose said.

The next phase was to automate the publication and distribution of the tariff pages. To do this, LeRose said, Sea-Land decided to tie the microcomputer network, located at the firm's corporate headquarters in Menlo Park, N.J., to the firm's host IBM mainframe in Elizabeth, N.J., about 15 miles away.

The microcomputer network was to be treated as an IBM 3271 control unit and was to send and receive transactions from the host 3033 processor via IBM's CICS. In order to tie these two systems together, LeRose explained, special software and a customized chip were designed.

Once data was available to the host, an on-line CICS tariff recipient system was developed to service those recipients needing hard copies of the tariffs. A Xerox Corp. Electronic Printing System was installed at the Menlo Park facility and linked to the 3033 host via a 56K-byte communications line, a Paradyne Corp. Pix communications system, LeRose explained.

This solved a big problem, LeRose continued. Not all tariff recipients got the same tariffs. And daily multiple mailings for the same recipient were often required. By using the host system recipient and distribution programs, hard-copy distributions of tariffs could be automatically sorted and directed to their correct recipients. And mailings were reduced to one per day, per recipient, according to LeRose.

By using a Xerox 8700 laser printer under program control, Sea-Land can produce graphics in various fonts. By programming conversion routines into the microcomputer network, Sea-Land made sure characters and graphics could be displayed and sent from one machine to another, LeRose said.

The Xerox 8700 is used to print both tariffs and a cover sheet that functions as a mailing label. The cover sheet is printed on a colored paper stock, while the tariff is printed on white paper.

The 3033 host processor sorts the electronic images so that, when printed, the tariff pages and cover sheets are produced as a complete package.

The package is then slipped into a window envelope for mailing. Since each recipient's tariff pages are color-separated, Sea-Land has been able to overcome distribution problems, LeRose said.

For locations that do not need a hard-copy version of the tariffs, Sea-Land installed about 1,000 IBM 3270-type CRT terminals. This allows the remote locations to have almost instant access to a tariff once it has been published, LeRose said.

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Audiovisual Training Group Cuts Costs With WP System

WINDSOR, Conn. — Productivity went up and production costs came down — both by about 30% — following a move from typewriters and a centralized word processing system to an information system, according to David Pope, a manager here at the Power Systems Group of Combustion Engineering, Inc.

Pope's department of 47 engineers, writers and illustrators produce audiovisual training materials for use with their company's product line of steam generating equipment for electronic utilities and industrial plants. Churning out some 40,000 pages of training manuals a year, the department had been operating with the help of typewriters and the company's central word processing department.

The significant improvements in operations reportedly occurred in October of 1982 when the department installed a Xerox Corp. 8010 professional information system, Pope explained. "Being able to cut and paste and add graphics electronically are the major advantages of the Xerox system," Pope contended. "We expect to reduce our annual printing and word processing costs by $100,000, and we've done away with a very cumbersome and unproductive editorial process as well."

Pope said the typical training or maintenance manual runs three to five volumes long, and each volume might have as many as 700 pages. "Most jobs required seven document creation and revision steps, and each step took two weeks," he related. "Now, we've cut our turnaround time in half."

The Xerox system is comprised of seven Xerox 8010 professional workstations, an electronic file that stores 35,000 printed pages of information and a laser printer that stores and reproduces three families of type styles, Pope explained. The machines are linked together by a Xerox Ethernet local-area communications network.

The 8010 workstation has a desktop electronic display that accommodates up to two standard pages of information or a portion of as many as six pages to simplify copy revision and editing, Pope said. Symbols for familiar office objects, such as letters, file folders and in/out baskets, move copy blocks around and create graphics.

The system's interface is a hand-held mouse control that moves work on the screen from symbol to symbol in the electronic equivalent of retrieving paper from a filing cabinet and bringing it back to a desk for revision. All composition is accomplished on the screen, according to Pope, and so the printed page, including type choices and graphics, looks the same as the screen version.

"Very few of our people in Training and Publications Services had any experience with computers or word processors," explained Ronald Lysik, Power Systems' manager of Systems Development Services. "Some of them can't even type. But they're all authors now, in a very different way from before."

Data Security Workshop Slated to Begin May 31

ORLANDO, Fla. — The International Association for Computer Systems Security, Inc. (IACSS) and Data Security Workshops, Inc. will hold their 55th International Operational Data Security Workshop here May 31.

The four-day workshop will include 19 sessions on topics such as the technical and administrative controls dealing with the security problems of distributed processing, computer facilities support, communications security, personnel controls, backup and recovery contingency planning, and logical and physical access controls of programs and data.

Registration for the workshop costs $775 for members; $825 for others, from IACSS at Six Swarthmore Lane, Dix Hills, N.Y. 11746.

Division Finds Own System Now Feasible

McHENRY, Ill. — Technological improvements and cost reductions in hardware and software have allowed the Gearmaster Division of Emerson Electric Co. to implement its own in-house computer system separate from the parent company.

"Cost-justification of a totally separate system has only recently been made feasible," explained John Bigelow, systems manager for Gearmaster. Prior to installation of its own system in April 1982, Gearmaster had a batch-oriented system tied into Emerson Motor Division in St. Louis.

Two Datapoint Corp. Model 3600 terminals were used for data entry into a 64K-byte Datapoint 5500 computer here; then the data was sent over telephone lines to St. Louis for number crunching, he explained.

"The limitations of the batch system were recognized by Emerson, and we were encouraged to seek alternate solutions," he recalled. Gearmaster manufactures linear actuators and gear motors mainly for the medical field.

Main Concern

The division's search for the right computer solution began in late 1981. Gearmaster's main concern was to find manufacturing software for inventory control. With IBM's Mapics software in mind, the firm looked at the IBM System/34 and System/38 and systems from Hewlett-Packard Co. and Burroughs Corp.

In investigating various systems, Bigelow pointed out, "We didn't want to reinvent the wheel. What we observed was that packages from Systems Management, Inc. (SMI) [of Rosemont, Ill.] seemed to follow closely to the way we ran our business as a straightforward manufacturing process."

After attending a manufacturing seminar at SMI the following February, Bigelow was "even more impressed," he said. SMI offered to do a test run on SMI equipment with Gearmaster data.

Gearmaster accepted the offer and supplied a representative portion of inventory and sales information. The test system was up and running in two weeks.

"Nothing needed to be modified within the SMI system," he said. "The programs were used as is, and we were able to do a 'live,' on-line demonstration for Gearmaster and Emerson management. Based on that, we were given the go-ahead."

Gearmaster purchased the IBM Series/1-based system in April 1982, but during the implementation period from April to December, it leased a Microdata Corp. Reality system that ran parallel with St. Louis for a control comparison.

Gearmaster now has its own 256K-byte Series/1 Model 4955 with eight IBM 3101 terminals and a 300 line/min IBM 4973 Model 2 printer. The Series/1 uses SMI's Pick operating system and SMI's proprietary RPL programming language.

The software currently being used is a combination of applications from SMI's integrated Manufacturing Control Systems and Business Control Programs. The manufacturing applications are bill of material, inventory control, requirements planning, on order and cost control.

The financial/accounting applications are inventory and purchase order. Gearmaster expects delivery of routings and work-in-process applications "within two weeks," Bigelow said.

The only modification made was one to allow multiple storage locations to be inventoried in the stockroom, Bigelow explained. "The reliability of the hardware and the usage of the software has been very good," he said. "We haven't had problems since we put it on the IBM hardware; the Series/1 just sits there like a refrigerator, purring."

There is no data processing staff at Gearmaster, only a data entry clerk who acts as overseer and performs file saves. "We got a plain vanilla system from SMI, so we get 100% support," Bigelow said. "We plan to keep the system as clean as we can for as long as we can."

INTRODUCING YOUR WINDOW TO THE FUTURE.

The highly sophisticated 5620 asynchronous terminal is indicative of what you'll be working with in the future, as well as what you can expect from Teletype Corporation. It's a low-cost, dot-mapped, UNIX*-based terminal that offers a good value in switched or point-to-point private line environments.

What's most impressive about the 5620 is its unique capability to divide the display into multiple "windows" of varying sizes. Our electronic red "Mouse" lets you easily create and control the windows. And because the host views each window as a separate terminal, several functions can be in process on the 5620 at once. For example, a programmer can work on one program while one or more are compiling and the terminal is receiving and displaying electronic mail. You can also download the 5620, and run programs independent of the host.

While the 5620 is a programmer's dream, it's also a valuable business tool. It can be used to compare and contrast multiple business situations or cases simultaneously; to develop one case while one or more are being executed; or to examine two sets of files from more than one data base side by side.

You'll enjoy extremely high resolution no matter how much you put on the screen. The dot-mapped display boasts 100 dots per inch resolution on a 15 inch diagonal monitor. You can address a dot anywhere on the screen, which gives you full graphics capabilities. Line drawings and tracings can be made with the "Mouse."

Although the 5620 is complex, it's not difficult to operate. You can use the "Mouse" to control terminal functions through a series of user-friendly menus. There's also a full complement of ergonomic features like a low-profile keyboard that's light enough to rest in your lap, a high resolution screen with brightness control, and a special faceplate to reduce glare.

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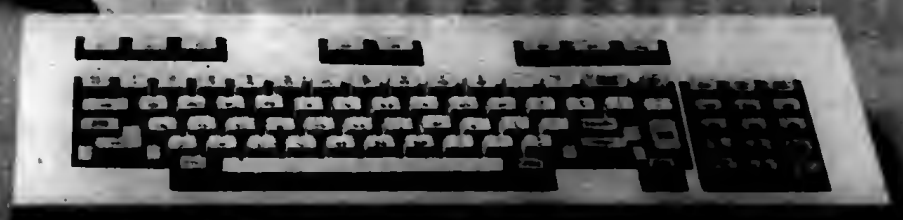

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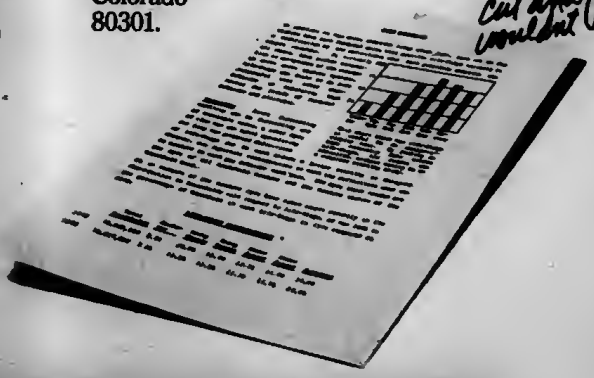

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Controller Regains Control With Report Generator

WINTER PARK, Fla. — With 14 retail stores each downloading point-of-sale (POS) data from terminals nightly, the controller's office at Shoemaker Bari of Florida here found itself beseiged with management requests for various reports when its IBM System/34 was installed 18 months ago.

And as more applications were implemented, management's clamoring for additional reports was often met by delays caused by implementation timetables or requirements for the in-house development of more software.

At the same time, many managers were involved in projects such as financial projections and budgeting, which produced heaps of paperwork involving hours of manual calculations.

So Richard Evans, Bari's controller, began searching for a software package that would be flexible enough to meet a range of growing requirements, simple enough to be implemented fast and reasonably priced.

Product Selection

After scanning the advertisements and product announcements in trade journals, Evans settled on Calc/34, licensed by Westmoreland Systems, Inc., also of Winter Park.

"The price was right, the package seemed to have the features we were looking for, and Westmoreland was right around the corner from us," Evans said, explaining his choice of Calc/34.

Within a week of installing the package, Evans, who had no programming experience, was able to complete his first model monthly sales worksheet, which computes sales tax payable, managers' bonuses payable for each of the 14 retail outlets and sales reported to each of the malls in which the company operates. The model, Evans said, now saves the company four man-hours per month.

He then developed a list of areas where the package could be used in place of manual reports and worksheets. "I was amazed how simple it was to build a model," Evans said. "It is basically a three-step approach involving naming the rows and columns of output desired, defining and listing the input items and writing the calculation statements in order to change the input values to the desired output results. All that is required to write a group of calculation statements comprising a model is the ability to think logically and use basic math."

Other Models

Evans followed his first model with two others designed to replace manual payroll and sales reports. He said the company saved about 20 man-hours in doing so and produced better quality reports than could have been achieved manually.

His fourth model was designed to provide management with a forecasting tool for decisions relating to new store openings, a model that would use management's estimates of key variables such as sales, profit, interest rates and turnover to arrive at various project possibilities.

"We found ourselves able to get the answers to 'what-if' questions that previously were unanswerable," Evans said. "It is now company policy to evaluate each new store using this model."

Other models developed at Bari using Calc/34 include a financial budgeting model and a markdown planning worksheet.

Evans now uses Version 4 of Calc/34, which costs $2,500. This latest release, he said, is more powerful and uses less CPU memory than its predecessors.

Directory Profiles Distributors Of Micro Software

WASHINGTON, D.C. — Software Research Co. has announced a directory for microcomputer software. "Micro Software Distributors: A Sourcebook for Publishers Seeking New Markets" contains profiles of 150 companies actively seeking programs for resale.

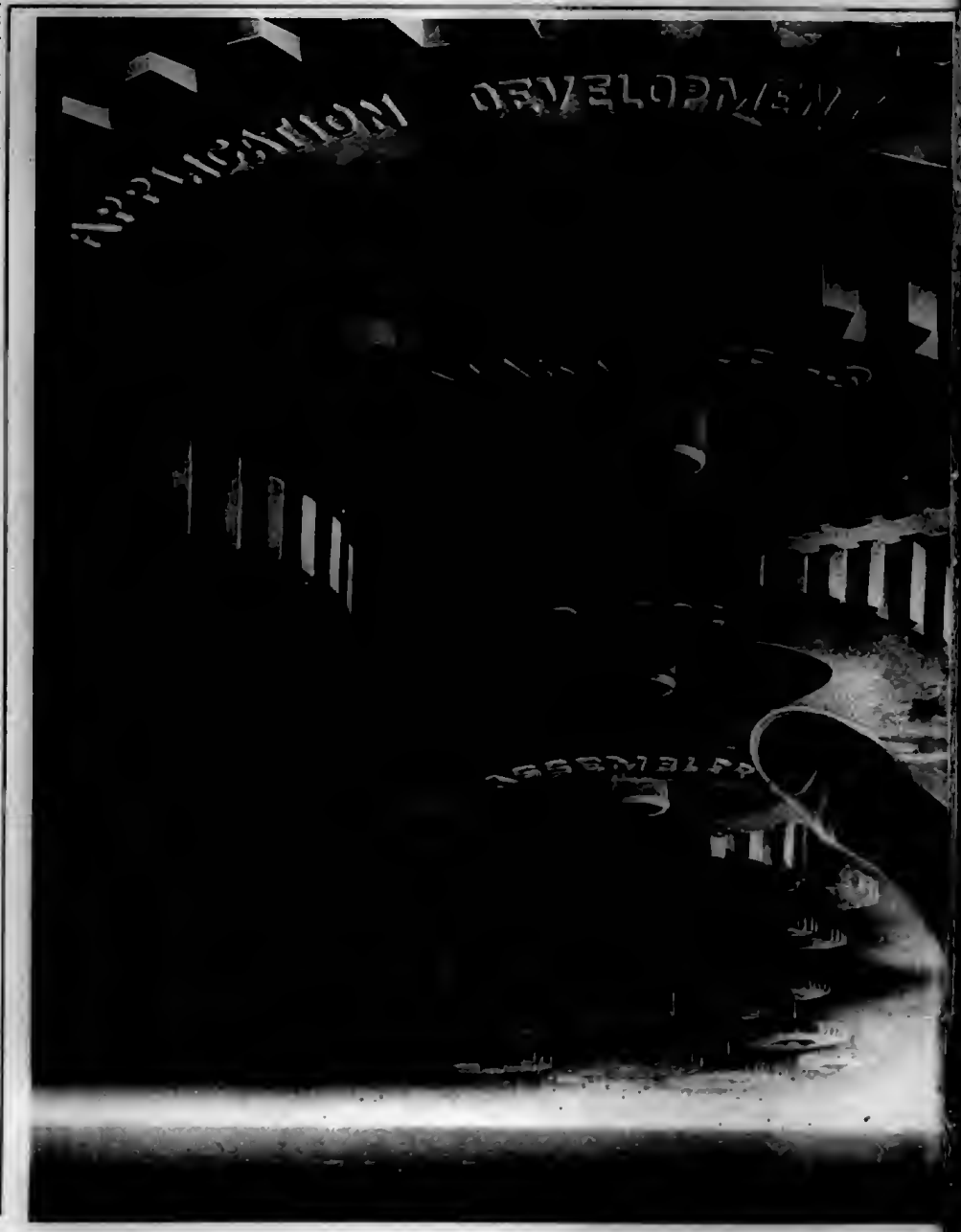
Included in the directory are hardware manufacturers, software houses, book publishers, hardware and software distributors and mail-order houses, according to a spokesman for the vendor.

Edited by Richard Loftin, a software marketing consultant and lawyer, the book features each distributor in a full-page listing that describes the company, the kinds of software it seeks, what it pays for software, the marketing right it obtains and how to submit a proposal.

For programmers who are not interested in becoming publishers, the directory identifies 100 organizations that publish software as well as distribute it, the vendor said.

Available in June, the directory is priced at $95.

More information about the publication is available from Software Research Co., Drawer 1, Box 9524, Washington, D.C. 20016.



Halfway to Paying for Itself

Western Union Expanding Terminal Network

UPPER SADDLE, N.J. — Dissatisfied with telephone and teletypewriter-based message service communications, Western Union, Inc. purchased a transaction processing computer system in 1980 that will pay for itself in under four years from labor savings and the prevention of duplicate money orders.

About one-fourth of Western Union's $907 million in 1981 revenues was generated from selling message services (including money orders, Mailgram messages and telegram messages), which are stored and switched by its Infomaster computer complex. Infomaster is split between two large sites, one in Middletown, Va., and the other in Bridgeton, Mo., each of which terminates approximately 3,000 lines.

Although Infomaster has been in service since 1972, Western Union's public offices and 8,500 public agents have used either teletypewriters or a telephone to transmit messages and money orders to Infomaster. In 1978, the common carrier decided to look into giving its public offices and large agents CRT terminals for communications, replacing the older model teletypewriters and equipping the telephone locations.

It began the process by first testing the concept using a Nonstop computer system from Tandem Computers, Inc. for its Mexican money order operation. This meant installing the terminals in Dallas, where money orders sent south of the border are collected.

Other Machines

Western Union did consider other manufacturers' machines. "We developed a matrix with a number of requirements," said Ira Clark, senior technical staff, systems engineering, at Western Union headquarters here. "Some major issues were fail-safe operation and program development."

Reliability and continuous availability are inherent in the Nonstop system, he said. Because it is designed for on-line transaction processing, it is a fault-tolerant system that continues running even if major components such as the processor, disk drives or memory modules fail, he said.

The two-processor Nonstop system located at the Infomaster site in Bridgeton enables Western Union operators in Dallas to verify money orders, convert them to Mexican telex protocols, transmit them and keep an audit trail on disk storage. It uses two 240M-byte mirrored disks and will pay for itself in under four years from labor savings and the prevention of duplicate money orders, Clark maintained.

"Before we installed the Tandem system, the Mexican money order operation was largely a manual process with room for error and duplicate transmission of money orders," he explained. "But the real cost savings came with software development," he added. He pointed out that money saved here would likely be saved again, in greater quantity, when it came time to create the software for the public office modernization.

Source Code

"We generated about 50,000 lines of source code in only six months for the Mexican money order system," he stated. "It's a fairly substantial amount for on-line programming. We were able to do it with the Tandem Pathway screen-oriented Cobol and Tandem's system language, TAL. It was only because of the Tandem-supplied software and development aids that we were able to implement that amount of source code in so short a time.

"We are in the process of installing an eight-processor Tandem Nonstop II system with approximately 500 terminals across the country," Clark observed. "We'll use 50 multidrop 4,800 bit/sec lines, each with about 12 terminals. We'll start by putting the money order business on the system, and later add the message traffic — Mailgrams and telegrams that come in over the counter."

The system will be used both to enter money order and message traffic into Infomaster and to deliver money order drafts to Western Union's check writers and messages to printers in the public offices and agencies.

The money order process will also be improved so that money orders are stored in a data base, rather than being transmitted directly to their destinations.

"We want to upgrade the service so that people can collect their money orders regardless of whether they can reach a particular office or agent," Clark said.

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Appointment System Cuts Doctor 'Downtime'

FOUNTAIN VALLEY, Calif. — By converting from a manual to an on-line appointment system, a health maintenance organization here has improved the quality of patient service and has reduced doctor "downtime."

"Waiting times for patients to get appointments were getting longer and longer, and the patients' patience was getting shorter and shorter," recalled John Kozlak, director of management information systems for Family Health Program, Inc. (FHP).

That was the situation three years ago when FHP — with 75,000 patient/members and seven medical centers — based its appointment-making operation on "a big lazy susan, about eight feet in diameter, that contained binders for each doctor's appointment schedule," according to Kozlak.

At that time, there were 12 workers who took an average of four to five minutes to make a patient's appointment by manually searching through the binders until they found a mutually agreeable time for each appointment. "We were putting the patients on hold and making them wait for an operator," Kozlak said, "and the waiting times were increasing."

Something had to be done, so a project team developed requirement definitions, and the group started looking around for a computerized system.

After studying Mumps support hardware from Digital Equipment Corp., Tandem Computers, Inc., Harris Corp. and Data General Corp., FHP chose software from Atlanta-based HBO and Co., written in Mumps for the DG C-350. The software was modified for FHP's needs.

After a month's stabilization of the hardware, the system became fully operational two years ago. With mirror-image C-350s located in Santa Ana, Calif., the primary CPU currently is multiplexed to more than 40 terminals and printers in FHP's seven medical centers in Los Angeles and Orange Counties.

With the new system, the number of appointment workers has been reduced to seven. In addition, the time needed to make each appointment has been cut to an average of one minute.

With automation, the appointment maker first calls up the basic data on each patient, including his primary care physician and health care center. The worker then consults the physician's electronic appointment calendar and gives the patient the first available date and time. The worker uses the system to confirm the patient's eligibility, home address and home and work telephone numbers.

Appointment makers at each of the seven medical centers can make and change appointments. Each afternoon, the system transmits to each medical center a printout of each physician's schedule and patients. This simplifies the work of medical records personnel, who pull the patient files prior to each appointment.

The system has several benefits besides time savings, according to Dr. Raymond Pingle, vice-president of medical and provider services.

"It provides greater flexibility in appointment making and rescheduling," he noted. "It also enables the patient to see the same doctor and minimizes mistakes in communications among doctors, patients and the scheduling desk," Pingle added.

The system also ensures "less doctor downtime," he noted, because cancellations have a greater chance of being filled since most appointments are made on a first-available basis.

In addition, automation prevents patients from booking multiple appointments for the sake of convenience. Also valuable are the reports generated by the system.

Reports include appointment scheduler productivity data, patient flow data and information concerning the average wait for an appointment. The DG C-350s each have 512K bytes of main memory, two 6060 disk drives and a 45 in./sec tape drive.

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Decides to Go With One Vendor

Accounting Firm Standardizes WP Operations

By Bob Johnson
CW New York Bureau

NEW YORK — One of New York's Big Eight accounting firms had a big problem. It had nearly as many different kinds of word processing equipment as it had international offices.

In an effort to standardize systems to deal with what it called a "mill of paper work," Deloitte Haskins & Sells (DH&S) decided to bring in one vendor to meet its operating needs.

After conducting an in-house study of WP and what it would mean to the accounting operations of the firm, DH&S decided that a multimillion dollar purchase for a companywide extension and standardization of WP was in order.

"Once we decided that this was the way we wanted to go, we isolated a dozen of the major suppliers of such equipment," said Gerald G. Scherocman, manager of the firm's practice office systems.

"Then we held a vendors meeting and presented the attendees with our formal request for proposal (RFP). Nine of the 12 responded to the RFP and, from this number, we rather quickly narrowed the list to four suppliers," he continued.

Specific Needs Emphasized

Scherocman said that DH&S sat down with each vendor and emphasized the specifics of what the company needed.

"Aside from the standard WP capabilities," the manager explained, "we were very concerned with the equipment's ability to be upgraded. This upgrading would have to be accomplished with a minimum of further expense and effort; in other words, we didn't want to get into a companywide system that would be rendered all but obsolete by future technological developments. We wanted a system that would grow comfortably with the release of further technology."

Another consideration was the ability of the vendors to support and service adequately the firm's field sites or "practice offices." Scherocman also wanted to know how the vendors would handle support of other locations in the U.S., even though the equipment was bought out of the New York office.

The vendor of choice for DH&S was Wang Laboratories, Inc., which installed its OIS and VS systems throughout the accounting firm's worldwide network of branch offices. Scherocman said that 71 OIS systems are currently installed domestically; by the time the implementation is complete, about 100 U.S. offices will be using the WP systems.

"We have even begun to install systems outside of the U.S. as well, in places such as South America, South Africa, Australia and the UK," Scherocman noted.

Although the company finally selected a vendor it felt would meet its needs, the selection process was not an easy one, according to Scherocman. The manager said that some very "penetrating" questions had to be asked about the vendor companies, such as "the line of succession."

"Other companies may not be this concerned about selecting a vendor, but there was a lot of money and a significant commitment at stake. We didn't want to leave one stone unturned."

In the upending of stones, the DH&S WP search team discovered that it was in for some surprises. The four finalist vendors were asked to tell in detail how they would handle a service problem at a remote location. Scherocman recalled some interesting answers.

"One supplier admitted outright that it couldn't handle our smaller offices with the type of service we expected. Another supplier had the ability to service most of our offices, large and small, but it couldn't give us the shared-access system that we decided would be better than standalone units."

The manager went on to say that he was really shocked when another vendor said that it would sell DH&S a "repair kit" for each office so each operator could fix an equipment problem herself. If she had a problem she could call a special 800 number and the vendor would talk her through the repair.

Major points such as system upgrading with a minimum amount of effort and expense, service and support and ease of learning convinced DH&S after a personal meeting with Wang that it was most suited for the job, Scherocman said.

Considering ease of use, Scherocman maintained that because "scarce" WP professionals did not have to be hired for the systems and that a drop in demand for administrative help is predicted, the system will meet the company's plan for a complete payout in two years' time.

Although the company primarily uses its system for WP and list maintenance, Scherocman said that studies are under way to integrate WP with a mainframe computer for distributed processing capabilities.

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Plastics Firm Automates Job Quotation Process

HAMPTON, N.H. — With a computer acting as both teacher and processor, nontechnicians at a plastics manufacturer here have automated the firm's job quotation procedures.

Complex, Inc., which manufactures extruded plastic disposables such as intravenous tubes used in hospitals, employs approximately 50 people and produces over 20 million feet of tubing annually.

Established in 1981, the firm soon recognized its need for a computer system that could adapt to its rapidly changing requirements.

According to President Robert Hunter, the company wanted to automate its job quotation procedure, which involved "a complex set of calculations based on customer order variables such as materials used, extrusion rates and quantity desired."

Until that time, this process was accomplished by hand, usually by Hunter himself. An automated job quotation program would relieve Hunter of this tedious task and enable any employee to respond to requests for price quotation over the telephone.

'The Perfect Fit'

As Complex began discussions with computer vendors, it became obvious to Hunter that while his options were many, he was hard-pressed to find "the perfect fit."

Also, the integration of an automated job estimation program with future programs was a major consideration.

When Complex was introduced to the Computer-Aided Programming for Computer-Aided Business (CAP/CAB) concept of Unidata Systems, Inc.'s 3000 small business system, Hunter felt positive his company was "on the right track."

The system, which features Unisyn, the vendor's applications generator, is said to enable users to do their own programming with the aid of a computer acting as tutor and coach as well as intelligent processor.

Because Unidata's applications generator is embedded with a knowledge of the life cycle of business forms, programming is reduced to no more difficult a task than answering pertinent prompts relating to the format of existing business forms and to making decisions when requested to do so by the CAP/CAB software, Hunter explained.

In the summer of 1982, Hunter purchased the Unidata system.

"Complex got more than it expected when the process of automating the job estimating procedure started. Not only was the computational procedure totally programmed and debugged in less than five hours, but the company also ended up with a comprehensive data base on which all of our future needs, such as inventory control and order entry, could be based," Hunter said.

Were there any problems? "Initially, the company experienced some minor procedural problems, such as not considering every possibility which had to be considered before the cost of an item could be computed.

"But once that oversight was recognized, the company adjusted its procedure and solved the problem in a matter of minutes," Hunter claimed.

As hard as it is for Hunter to believe that a nonprogrammer like himself would be able to outperform an experienced programmer, it has been true in this case.

"Everyday, Complex employees produce computerized quotations for extruded plastic tubing, having automated the entire procedure without professional assistance and a minimum of disruption," Hunter asserted.

"'Almost like magic' was our reaction when our first computer program ran successfully.

"It wasn't that we were overwhelmed by the mysterious, superfast calculating machine, but that our complicated job estimating procedure had been automated, without the use of existing software or custom programming, in just five hours," he concluded.

Report Rates IBM 4300, 30

CHERRY HILL, N.J. — The IBM 4300 and 30 series processor lines have been evaluated in a study titled "Datacomm & Distributed Processing Report," published here by Management Information Corp. (MIC).

The report analyzes the nine models that comprise the IBM 4300 series, ranging from the 1M-byte 4321 Model Group 2 to the 16.8M-byte 4341 Model Group 12, as well as the 3030 and 3080 lines, which consist of 14 models with up to 67.2M bytes of memory and up to 2G bytes in virtual memory. Each model in these respective series is broken down according to performance, memory capacity and components.

The report is available for $49.50 from MIC at 140 Barclay Center, Cherry Hill, N.J. 08034.

System Switch Cuts Costs, Time For Hospital/Asthma Center

DENVER — When the National Jewish Hospital/National Asthma Center decided to switch from its Four Phase Computer Systems, Inc. key-to-disk minicomputer system to an on-line data entry system, it did not have to look far for a system to save both time and money.

The 140-bed hospital, which has an international reputation as a leader in treating and researching respiratory diseases and disorders of the immunity system, had been using Phoenix Computer Corp.'s Condor on-line program development software system on its IBM 4341 system since March 1980.

When the vendor came out with its Falcon on-line data entry software last summer, the hospital was immediately interested.

"Condor worked well for us," commented systems programmer Fred Learman. "We had faith that another product from Phoenix would be of the same quality."

The director of the computer resource center at the hospital, Jim Harbin, agreed: "The choice was obvious because we had Condor and knew that product was good."

Hardware Costs Cut

Besides the convenience of being able to enter all hospital data on one IBM 3270 keyboard, which Learman estimates saves the operators about 10% of their time, hospital administrators have discovered other benefits integral to the Falcon system. Harbin estimates the new system is saving the hospital about $1,200 per month in Four Phase hardware costs alone.

"Another benefit to me is that I can now turn the format programming over to my regular programming staff," he continued.

"Before, I had to have a specialized person who could program the key-to-disk system. This saves me money in personnel costs," Harbin explained.

Instead of hiring a programmer for about $17,000 per year, Harbin said he can make do with an operator for roughly $5,000 less.

Vulnerability Decreased

Learman pointed out that the system has also alleviated the problem of having only one person familiar with Four Phase programming.

"The department was very vulnerable when one specific individual had to be involved in every new or changing data entry function," he said.

"As far as convenience," he continued, "Falcon has saved us quite a bit in terms of operators. They had to deal with nightly backups on the Four Phase as well as on the mainframe. Falcon saved them about two hours a night."

Learman added that Falcon has resulted in improvements in cases of system failure as well.

"Now, if something goes wrong, I can get to it from the terminal in my office. Before, whenever there was a problem, I had to find an available Four Phase terminal, which often meant one in another building a quarter of a mile away," he explained.

If you're looking for the best terminal value, look to a familiar name: TeleVideo. The story of our new 924 is the same story you've heard for the last four years. We've combined the best innovations in technology, design, and quality manufacturing to give you everything you want in an advanced terminal. And we've done it at a price that can't be beaten.

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TeleVideo Systems, Inc.

Breeder Finds System Makes Horse Sense

KERRVILLE, Texas — Since it began operations in 1979, Shelton Ranches here has believed that it makes good horse sense to use its computer resources, in addition to instinct, in raising prize quarter horses.

For one reason, horse breeding is big business in these parts. At an annual sale last fall, 89 Shelton ponies fetched $882,000.

So when Shelton started breeding horses, it bought an IBM System/32, which it replaced within two years with a System/34. And recently Shelton replaced the System/34 with a System/38, continually expanding its breeding operations with the increased use of its data processing resources, according to Ed Schroeck, Shelton's DP manager.

Schroeck said the decision to go with IBM initially, and thereafter for upgrades, was based on a consultant's recommendation. Schroeck said, "Together with the consultant, we felt IBM was the main vendor in the marketplace. They have the service we want."

Today, Shelton's System/38 supports nine CRT terminal users, a 500M-byte 3370 disk drive and an IBM 3262 600 line/min printer.

Proprietary software was developed in-house with the aid of SPI Software Co. in Houston. The main package written, Equine Management Information System, was recently granted a copyright, Schroeck said, and Shelton now has plans to market the management package.

"It seems we're always finding a new way to do things here with the computer, or better ways of doing the same," Schroeck said.

For example, the system keeps detailed medical and breeding records on Shelton's 300 mares. Before the system was fully operational, Shelton workers had to use a card file, manually sorting through the cards to record what had been done each day to each horse, then determining what needed to be done the following day.

Now, Shelton's veterinarians feed that information into a terminal in the breeding barn. The system produces a report of the day's activities and also keeps track of where each horse is physically located, be it in the barn, pasture or paddock. Each veterinarian thus saves some four hours of work each day compared with doing the same jobs manually, Schroeck said.

The system also allows any of the veterinarians to take a vacation without worrying about adequate coverage, as any qualified veterinarian can access the system in an emergency, he said.

When a new horse arrives at the ranch, all pertinent breeding information is fed into the system, including its ancestry, marking and previous medical history. This information can be recalled by using a horse's name or its registration number. Also included in the horse's personal file are vaccination and shoeing schedules and other medical treatments.

On the business side, the system stores account information, completing billing documentation for horses' owners. Lastly, the system aids in breeding healthy, salable animals by carefully tracking the most opportune times to attempt artificial insemination, Schroeck said.

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Our DP-55 will print a one-page letter in about a minute. A 12 CPS machine takes five.

You may be happy to wait five minutes for your letter. But remember, while the computer is tied up running the printer, it may not be available for other jobs.

Bad design can make a smart operator look dumb.

People with otherwise normal dexterity sometimes become all thumbs around a computer printer. The fault is usually the machine's.

Our DP-Series printers were designed with the operator in mind. A status display is standard on the DP-55. The printhead mechanism tilts a full 90° to make printwheel changes a snap.

Industry standard ribbons and plastic or metal printwheels are available from Dataproducts or local office supply stores. More than a hundred type styles are available, so you can match most any office typewriter.

A printer's no better than the technology behind it.

Some companies are pushing the limits of their technical knowhow and offer little more than souped up typewriters. Dataproducts has decades of experience in the design and manufacture of sophisticated, high-speed computer printers.

Our daisywheel printers are serious business machines, engineered to perform reliably for years and years. And to provide their users the greatest productivity at the lowest cost of ownership.

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Virtually every major computer manufacturer buys printers from Dataproducts, then resells them with their name on them. For them, Dataproducts is synonymous with quality and reliability.

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Micros Focus Of MIS Meet Set for Oct. 24

NEW YORK — "MIS: The Micro Link" is the theme of the third annual Conference on Management Information Systems (MIS), which will be held here Oct. 24-25 by the Center for Management of Baruch College.

Four major topics will be covered: executive systems, centralization vs. decentralization of DP, decision support systems and micros and office automation.

Sessions will be directed toward DP and non-DP managers who are using and planning for the use of microcomputers as a management tool. Attendees can expect to obtain information on specific applications and become familiar with the benefits and pitfalls of widespread use of micros in the total MIS picture, according to a spokesman.

The registration fee is $145. The Center for Management of Baruch College can be reached at 17 Lexington Ave., Box 520, New York, N.Y 10010.

Reference Set Covers Software

ESTILL SPRINGS, Tenn. — Associated Technology is offering a four-volume reference set that was designed to serve as a software management tool for establishing a company's internal programming and documentation practices.

Three of the volumes cover standard methods for programming in Cobol, Fortran and Basic. The fourth covers software documentation practices.

The set costs $45 through ATC Books, Rt. 2, Box 448, Estill Springs, Tenn. 37330.

Service Bureau Ties Turnkeys to Mainframe; Productivity Jumps 33%

MIDDLEBERG HEIGHTS, Ohio — An independent service bureau increased its job-processing productivity by at least 33% and trimmed business costs with the aid of a mainframe.

Ctrac Computer Services, based in the Cleveland metropolitan area, installed a Nixdorf Computer Corp. 8890 mainframe computer to handle clients' business inventory management projects. The mainframe acts as a central batch processing system and also as an interactive host — processing inventory data entered by clients on Ctrac's Minitrac turnkey business minicomputers. These small local systems are on-line, shuttling information between the mainframe and the client site.

Ctrac officials said that the 8890, which replaced an aging IBM 360/50 batch processor, has not only enabled the high-speed link to the clients' Minitrac systems, but also has helped the service bureau process more client work per shift. This extra performance allowed Ctrac to reduce its number of operating shifts, subsequently trimming power consumption, maintenance fees and other system costs. The company also said the Nixdorf system helps it use its programmers' time more effectively.

Ctrac Offerings

David K. Hamister, president of Ctrac, said Ctrac supplies business clients with computer services, tools and education that can help them closely monitor inventories, thus minimizing control and the purchasing uncertainties that commonly plague companies facing random customer demand.

Ctrac offers customers their own inventory control software systems and teaches them how to use this computerized recordkeeping process to phase in stocking items, automatically replenish them and efficiently phase out discontinued parts and products.

The client can use forecasting logic built into Ctrac software to establish basic inventory policy rules governing when to stock items, how much to keep on hand and when to drop an item.

Order Rules

Order rules in the system help clients specify when and how to restock or discontinue items based on standard stocking/nonstocking policy, seasonal or trend demand, automatic phase-in/phase-out/delete programs and other factors. Inventory managers can fine tune the system order rules with modifiers for lead time, set, ceiling and package quantities.

Management closely monitors the effect of stocking policies and purchasing decisions by reviewing Ctrac-supplied reports.

Periodically, customers update their inventory records by sending transaction data to Ctrac for batch processing, usually via dial-up telephone data transmission. As an alternative, Ctrac can accept inventory posting forms, mailed or delivered by the client, for data entry to disk and eventual output to punched cards, magnetic tape or diskettes. Processing is done over weekends, so the client receives reports and data by Monday morning of the next business week.

Turnkey Minis

Ctrac also sells, installs and supports Data General Corp.-based turnkey minicomputer business systems for clients who want on-site processing capabilities for order entry, invoicing, accounts payable/receivable, general ledger, payroll and other specialized business applications.

For interactive inventory control service, these independent systems can be linked to the Nixdorf mainframe for data entry, processing and return transmission.

Ctrac's inventory management services were designed to handle durable goods, service parts and industrial supply inventory.

The 10-year-old company has grown rapidly. Executive Vice-President David J. Normant recalled, "Only four years ago, we had 20 employees. Today, we have a staff of 30 salaried people and a total payroll of 135 persons. Our annual sales are about $3 million."

However, to keep pace with this organizational growth, increased customer demand for inventory management service and processing speed and other business pressures, Ctrac has periodically upgraded its computer system hardware.

Three Requirements

When Ctrac decided in December 1981 to replace its 20-year-old IBM 360/50 mainframe, company officials began a selection process primarily based on three requirements: processing performance, purchase/operating economy and IBM plug-compatibility.

At first, Ctrac primarily supplied batch inventory control services for small businesses. The service bureau used Sycor, Inc. Model 440 equipment for data entry and an on-site IBM 360/50 using Edos operating software.

"We only used the 440 for six months because it was too slow," Normant reported. "During our research for a replacement, we found that Entrex [now part of Nixdorf Computers] made the best data entry system then available — easy to use, very fast and able to support additional terminals without sacrificing performance," he added.

Ctrac quickly added those terminals. Two months after installing a Nixdorf Entrex 280 with four data entry stations, it upgraded to a Nixdorf Entrex 380 system with 12 stations.

Ctrac next decided to replace the 20-year-old IBM mainframe hardware, which was costing the company too much for downtime and maintenance.

(Continued on Page 56)

UNITED JERSEY BANKS DID.

COMPUTERISTICS DID.

FIRST NH DID.

Bureau Ties Turnkeys to Mainframe

(Continued from Page 55)

Many of their inventory management customers, although pleased with the basic Ctrac services, next wanted to access their inventory files directly to enter transactions and update records rather than record them manually for future batch processing.

Therefore, Ctrac decided to permit clients to tie the Minitrac business system (incorporating a DG CS/70 MOD/C6 mini with 512K-byte memory, DG 50M- and 192M-byte disk drives, a DG 800 bit/in. tape drive, display terminals and printer) to the new mainframe as an on-line interactive aystem.

Normant explained that the new mainframe had to be "inexpensive to purchase and operate, be compatible with IBM hardware, capable of high-speed interactive processing and hardware- and software-compatible with other major equipment vendors since [Ctec'a] clients have on-site systems from many different suppliers."

Product Survey

A survey was conducted of several products including IBM'a 370/145, 4331 Group 1 and 4331 Group 2; Control Data Corp.'a Omega and Nixdorf's 8890.

The last system evaluated was Nixdorf's newly announced 8890. "Our financial evaluation of the 8890 indicated that it would actually cost us $300 per month less than we were currently spending on the 360/50. Based on that fact, we decided to pursue it further," Normant related. "And perhaps most important — it was indeed plug-compatible with IBM'a hardware and software systems, as well as with all the other vendors' systems with which we interface," he added.

A Nixdorf 8890 Model 30 with 1M byte of memory and 600M bytes of disk storage was installed. The system includes a 1,600 bit/in tape drive, two high-speed printers and five video display stations. The 8890 can be directly interfaced on two on-site Nixdorf 380 data entry systems, each supporting 15 terminals. It is also equipped with telecommunications for transmission to off-site customers.

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July Meet To Cover Health MIS

BALTIMORE — The Health Care Financing Administration (HCFA) Bureau of Program Operations will hold its fifth annual "National Conference on Management Information Systems (MIS) — Benefits to Management" July 24-27 in Arlington, Va.

The conference will provide a forum for sharing successful MIS experiences in health care, learning about new technology and sharing new practices in health care systems. Sessions will focus on electronic billing, office automation, communications and Medicaid/Medicare cost containment.

The organization is seeking outlines for presentations, including names of suggested speakers and panelists. Presentations should last from one to three hours on topics relating to Medicare and Medicaid information systems implications.

Preregistration costs $25 and should be sent to the HCFA, Office of Methods and Systems, Division of Systems Planning and Development, Systems Planning Branch, Room G-A-1 Meadows E. Building, 6325 Security Blvd., Baltimore, Md. 21207.

Program to Offer Master's in DP

BOSTON — Boston University'a Metropolitan College will offer an employer-sponsored Professional Development Program next fall that leads to a Master'a Degree in Computer Science.

This two-year program is intended for individuals with strong academic backgrounds and an employer's commitment to pay tuition charges. Full-time university faculty will conduct all courses on Friday afternoona and Saturday mornings at the Digital Equipment Corp. training facility in Bedford, Mass.

Applications for September'a program are due June 1 and are available from BU Metropolitan College, 755 Commonwealth Ave., Boston, Mass. 02215.

'They Say Piano was His First Love, But He Had to Eat!'

Job Shop Metal Fabricator Turns To Real-Time Shop Floor Tracking

By Jim Holmes
Special to CW‡

AUSTIN, Texas — The installation of a real-time shop floor tracking system in a job shop environment has helped a metal fabrication manufacturer here automate its books and expand its business.

Grentek, Inc. is a medium-size job shop that specializes in metal-fabricated products. Most of its customers are high-tech industries located in the area.

In 1980 Grentek was located in an 11,400 sq-ft building, employed 40 people and had a booming business. The owner of Grentek, Bill Howard, felt the time was right for expansion. To support this expansion, a computer system was needed. A wish list was composed outlining the functions required of the computer system. These included an accounting system to automate the bookkeeping functions of the business and a manufacturing system designed for a job shop environment that included job estimating, tracking and costing.

There were many accounting systems that would do the job for Grentek. However, investigation failed to turn up any software that came close to meeting Grentek's manufacturing requirements.

These requirements were refined, at which time the job tracking aystem took on some added functions. To minimize people time and improve tracking accuracy, it was decided that the use of a family of shop floor terminals would be a definite advantage and a requirement of the system.

Change of Focus

When it became obvious that Grentek was not going to find a system to fit its needs, the decision was made to select a computer based on its ability to interface to the shop floor terminal(s) selected and to have a custom job shop package written.

The shop floor terminal found that best fit the company's needs was the Burroughs Corp. Series MTI500. Used as an optical character recognition (OCR) reader to retrieve tracking information from route sheets, it has a numeric keypad thet allows operator input. Burroughs also supplied a software package called Manufacturing Data Communications Systems (DACS) that runs the shop floor terminals, provides job tracking and inventory control and has the hooks and handles in place to allow the system to interface to the existing manufacturing control system.

Shop Floor Terminals

The configuration that was selected was a Burroughs B920 computer with eight shop floor terminals and several CRT terminals, 80M bytes of fixed disk, several matrix remote printers, a letter-quality remote printer for the OCR-readable route sheet and two matrix line printers. In addition, Grentek purchased Burroughs' Job Accounting and Costing system (JAX) and a program generator software package from Wilmark, Inc. called Adept.

By fall 1981 the system

(Continued on Page 58)

Course Covers Basic

NAPERVILLE, Ill. — Deltak, Inc. has announced a multimedia course series on programming in Basic. Called "An Introduction to Computer Programming" (No. 7EB-A99), the course was developed in conjunction with Guild Sound and Vision in Peterborough, UK.

The four-part series, which assumes no prior knowledge of programming and can be used by individuals or groups, provides a general overview of computers and programming concepts and discusses loops, address arithmetic operations, strings and arrays, sorting and subroutines, Deltak said.

Courses can be leased for between $50- to $125/mo or purchased for $1,750 each. Deltak is located at 1751 W. Diehl Road, Naperville, Ill. 60566.

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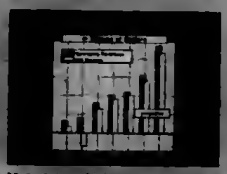

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Job Shop Goes to Real-Time Shop Floor Tracking

(Continued from Page 57)

had arrived and the appropriate people were trained. The first software package to be installed was the JAX. The installation was uneventful.

However, the installation of the job shop system did not go as well. The Burroughs-supplied software that supported the shop floor terminals would not be deliverable until mid-1982. This was not of too much concern since Grentek still needed to create its portion of the job shop system, which would include part estimating and quoting and job definition and costing. This was to be done with Adept.

As with most generative software, it was soon discovered that it was easy to generate programs, but difficult to get them to work together exactly as imagined. The system design was reworked many times before a livable design was produced that was also compatible with Adept.

In addition, certain functions could not be performed within the confines of Adept.

Consultant Hired

In mid-1982 a consultant was hired to complete the job shop system. By fall, key portions of the system were working. However, the Burroughs software would not be available until late 1982.

By September 1982 Grentek had expanded its manufacturing capacity by increasing its plant size to 25,000 sq ft and installing $500,000 worth of new machinery. The increased capacity and work load soon revealed that portions of the system could not keep up with the new volume of requests.

By January 1983 the modified software was installed and working fine. Attention was then turned to the newly arrived Burroughs shop floor tracking software. Installation was quick, taking only one day.

However, the hooks and handles for the interface to existing systems were designed for batch input and Grentek wanted a real-time environment. Also, there were some mismatches in field sizes between the Grentek-developed system and the Burroughs system. The necessary changes were made, and the system went on-line in March.

The integrated job shop system consists of three main modules: a shop rate and price/lot module, an estimating and quoting module and a job tracking and costing module.

The system works as follows. Customers submit blueprints of parts for bids. Grentek enters these parts into the estimating module, detailing the steps that are necessary to manufacture each part. For each step entered, a shop function is selected from the shop rate file. Since the shop rate costs are already known, the rate quantity is entered.

Once the part and step information is complete, a cost estimate is run which computes unit cost for the part for each of the lot sizes defined in the price/lot file. Costs are examined and can be overriden. Then a quote sheet report is generated showing the unit cost for each of the lot sizes for which the customer has requested bids.

If the customer accepts Grentek's bid, a job is created for each of the parts to be built. The step information for the part to be built is automatically moved into the job step file. Critical due dates are then assigned to certain steps. Once the job and step data is complete the job is released and a route sheet created.

Once work starts on the job the tracking system takes over. Each employee who works on the job logs on and off the shop floor terminals. The method is simple.

The route sheet is "swiped" through the OCR reader of a shop floor terminal as is the employee's badge. The employee then enters the step number being worked on. That is all that is required for logon.

For logoff information the employee enters pieces completed. The tracking system automatically posts elapsed time, date complete, pieces complete and employee initials to each job step requiring work. Actual times are costed, and a costing inquiry and report is available that compares times and costs for actual vs. estimated.

Once manufacturing is complete the pack and ship work center generates the pack and ship document and ships the job. After the job is invoiced and all outside service costs are posted to the job, a final costing report is run using quantity invoiced to produce the final cost calculations. The costing information is put into the cost history file. The job and step data is then deleted from the system.

It should be pointed out that things did not always progress smoothly. The system took considerably longer to get up and running than was originally projected. The expectations of what could be done with Adept were overly optimistic. And, of course, the initial budget estimates for hardware and software were exceeded.

However, Adept has been a valuable tool, without which the development time and expense would have been much greater. The system works, and the people who use it are continually thinking of ways to use those few more enhancements.

Holmes is the owner of Soft Concepts, a computer consulting firm based in Austin, Texas.

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Inventory Control System Helps Manufacturer Retain Quality, Competitive Prices

HENDERSONVILLE, Tenn. — Maintaining quality work and good customer relations are one priority for a manufacturer of hot-melt adhesive applicators here. But Mercer Corp. here must still maintain competitive pricing — and that takes inventory control.

"At one time we weren't adequately controlled," Dan Polk, director of data processing and inventory control, admitted.

The company's NCR Corp. I-8271 computer system with the NCR Interactive Manufacturing Control System II (IMCS-II) software package was installed in 1979, and Polk began optimum application of the system after his arrival in early 1981.

The system now gives Mercer strong, positive inventory control, as well as other production management, engineering and marketing support in the manufacture of hot-melt adhesive applicators.

Software Modules

The software package includes several modules: inventory management, bill of materials and other processing. The accounting modules include general ledger, accounts receivable and accounts payable.

"The vendor wrote a program to interface the accounting and order processing functions, which gave us the capability [to audit] before posting the general ledger," Polk said, "and that's a critical tool. We also have a custom pricing program for the engineering department so it can develop a sales catalog listing all the parts and what they must sell for."

Several other programs in the NCR IMCS-II system were modified to fit it to the firm's operations, such as the material requisition. Tied in with the inveotory management module, it now allows Mercer to initiate a production work order for a machine, have it allocate the parts and, at the same time, print a report listing those parts in numerical sequence with a description, the quantity, location and cost of each.

"We use the bill of materials module as the brain center for the entire application," Polk said. Mercer's engineering department designs more than 7,000 parts to be used in the manufacturing process and enters information about them in the bill of materials.

Before computerization, the parts for each machine manufactured had to be hand-listed, ranging from 250 to 2,000 parts per machine — a tedious, error-prone and time-consuming process.

For a given machine to be built, the parts were listed, the number needed, calculated down to the smallest screw, was listed, and each of those parts were assigned a price to arrive at the total material cost.

Now Mercer engineers are able to take existing structures and add, delete or otherwise change what is needed for a given set of customer specifications, and total materials costs are known immediately.

The bill of materials module itself ties directly into the inventory management module. Three data display terminals and a matrix dot printer are located in the inventory control area of the plant. One is also located in the purchasing and receiving area.

The inventory control clerk manages all in-house production orders for a given machine to be manufactured, entering them into the system through the bill of materials structure. The clerk also takes information from purchased items, pricing them as they come in.

As an order is received through order processing for a specific machine, the parts are allocated and identified in the stockroom; the earmarked parts are then pulled as needed during fabrication of the machine.

The materials are priced before the customer is quoted a price; then as the materials are actually pulled from stock, any variances of actual costs are noted. This way the firm knows at all times what the profit will be on the production of that machine even before the first part is pulled from inveotory.

"We're still a job shop," Polk pointed out. "We're working to achieve standardization, and I feel one of the keys to achieving that goal is being able to make the data in our computer system 99% accurate, especially in the bill of materials module."

Mercer now controls about $1 million in inventory. "The inventory management module has become the ultimate key we use to control and maintain inventory of purchased items as well as inventory items manufactured in-house," Polk said.

"It has also become a valuable tool in cost information that we must have to answer questions from salesmen about manufacturing costs on a given item. We can run a material requisition report on the item and give him the information based on the last time that item was made, including overhead, labor and materials costs. It gives a very accurate picture. If we change an item in a material requisition or bill of materials, it is reflected when we run the report," he added.

Inventory Management

Polk added that the inventory management module is a management tool for pricing information, movement of materials and control of inventory that is tied in with the order processing module.

Orders now come in through sales, and as they are entered into the order processing module, the system can display on a screen or in a printed report all parts that are required. Through that report, proper in-house work orders or outside purchase orders are generated. These orders, in turn, go into the customer files, and reports are made there that affect accounting functions such as accounts payable and accounts receivable.

"Through the inventory management module — which is the key au-

(Continued on Page 60)

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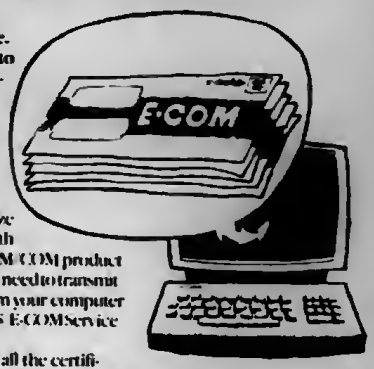

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Prefab Home Supplier Nails Down DBMS

MINNEAPOLIS — The combination of a data base management system (DBMS) and an on-line program development tool have aided the efforts of a manufacturer of precut homes to meet customer needs from initial contact through completion of construction.

For many Americans, skyrocketing real estate prices have turned conventional home ownership into an all-but-impossible dream. Yet for innovative individuals and companies, the present market offers unique opportunities.

At least that is the viewpoint at Miles Homes, Inc., a Minneapolis-based maker of precut houses for do-it-yourself home builders. Miles offers materials and financing for over 50 standard home designs, plus a list of optional variations, to customers all over the U.S. Meeting these customers' needs calls for an information system unique in the home-building industry. And with Adabas and Natural, Software AG of North America, inc. products for data base management and on-line program development, respectively, Miles has such a system.

According to Ken Warner, data base administrator and senior analyst at Miles, the company started investigating DBMS offerings in the summer of 1980. "In addition to Adabas, we looked at Cullinet Software, Inc.'s IDMS, intel Corp.'s System 2000, Cincom Systems, Inc.'s Total, Computer Corp. of America's Model 204 and IBM's DL/1. Before long, we'd narrowed it down to the first three products."

Combination of Factors

A combination of factors tipped the balance in favor of Adabas. "Adabas offered us a price break in our IBM 4331 DOS environment. But even more important, we didn't have a great big DP department, and it was clear Adabas would be simpler to install and get started on than any other system," Warner said.

"With IDMS, we were looking at bringing new people on board, then spending three to six months just to get them educated to a point where they could get started," he said. With Adabas, however, users were off and running after one week of in-house classes.

Another factor was the feeling that Adabas would be easier to live with and adjust to as Miles' needs changed.

Once selected, the new DBMS had to be installed on a tight schedule to coincide with the planned move of Miles' corporate headquarters. According to Warner, the use of Natural for program development was essential to the company's on-time system implementation.

"Natural enabled us to do more with fewer people. We took delivery in March 1981, and by June 15 we had our on-line order entry system up in time to meet our deadline. And we also got a substantial head start on several other applications," Warner said.

The current system not only takes orders but tracks each customer from order entry through financing and construction. The financial system has to be flexible in keeping with the nature of Miles' markets. For example, projects are often begun under no-down-payment construction loans, then later refinanced by means of conventional mortgages.

Also, since parts shipments must be made throughout each project's construction phase, raw material purchasing and inventory accounting are tied into the system companywide, enabling Miles' five manufacturing plants and distribution centers to meet customer commitments in a timely yet cost-effective manner.

Finally, the system is also used to generate customer profiles for sales and marketing and will soon be used to automate sales commissions.

"We're a growing organization," Warner said. "Even now, after two years with Adabas and Natural, I feel we've barely scratched the surface of what we could be doing. Yet when I think of where we'd be without these products, I know the decision we made was the right one for us. And I'm confident that as we go along further, we'll continue to find that Software AG's products really do provide a good foundation for our needs here at Miles."

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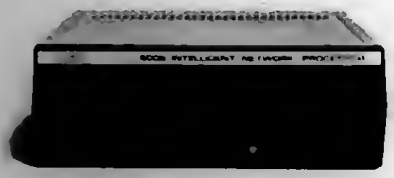

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Control System Aids Company

(Continued from Page 59)

dit trail back through order processing — before we invoice anything, we can detect whether that item has been placed into inventory so it can actually be removed," Polk explained.

"This prevents a fictitious minus status in inventory, with resulting incorrect [pricing] information. invoicing on the order processing is designed to tell you a percentage difference between actual cost and selling price, which will tell you if you're making a profit.

"Within a week, a person in purchasing who had no previous computer experience was able to enter data and use the system, and she was working on her own with manuals, menu layouts and very little help from me," Polk said.

Handles Growth, Increases Efficiency

Control System Irons Out Firm's Problems

ERIE, Pa. — A Pennsylvania manufacturer said it has achieved greater efficiency, better management information, more cost control and improved customer service since it installed a computer-based manufacturing control system.

Lord Corp., a high-technology manufacturer headquartered here, is a specialist in the production of products utilizing the bonding of rubber and metal. The high growth it experienced in the late 1970s brought problems to management's attention. The addition of two more manufacturing plants resulted in management information problems.

And when the company decided to integrate its multiplant operations, the problems grew even more acute.

Lord sought a computer system that could provide management information in a timely manner to both the remote plants and the central office. In 1979, after examining proposals from a number of vendors, Lord implemented a Univac Industrial System (Unis) 1100 interactive manufacturing control system, supplied by Sperry Corp., and a Sperry 1100/62 computer system.

"The Unis system had all the pieces in the right place. It seemed to be the most reasonable approach," Paul Ditmore, manager of data processing, said.

"The DMS data base management system [used with the Sperry Series 1100 computers] is a pretty solid piece of software and has always done a good job for us."

Having a strong data base system was important to Lord. The old system, created by the company, worked fine until a change was needed. The problem was no data base management system existed that simplified making changes; as a result, it took time to implement them.

One of the most interesting aspects of Lord's new system is that it performs central material and production planning for the company's multiplant operation.

The company makes a material requirements planning (MRP) run once a week for all its plants. The system prepares manufacturing orders and production schedules for each plant, then informs each plant of its requirements. The system controls one local and two remote plants. A third remote plant will soon be added.

Dynamic Priority List

Each day, a remote printer spells out the work schedule at each plant in the form of a dynamic priority list. During the day, the plants report back the production status. This information and a new, up-to-date priority list are printed each day.

Previously, information was always several days behind current production. Remote plants entered all inventory transactions and production progress on cards, then mailed them to the home office.

"Now," said Michael LoSapio, manager of industrial planning for the Industrial Products Division, "we do everything on-line, including edits. When we inaugurated the on-line system, we had a ceremony and burned the card file."

The information generated by the on-line system has created respect at the remote plants for plans made at the home office. It is accurate, timely and a utility to local management, rather than an obstacle. The remote plants no longer wonder whether the home office knows what it is doing.

"When we show that we can do what we say, it makes a big impact. If any problems arise, we can correct them immediately," LoSapio pointed out. "Credibility is important because we don't have much face-to-face dialogue with the remote plants."

The accuracy of information has made it possible to pinpoint orders on the shop floor — a fact that has proven helpful to both marketing and customer service.

The more realistic information has

(Continued on Page 62)

IMC Elects Officer Slate

BETHESDA, Md. — The International Information Management Congress (IMC), a worldwide association for micrographics and information management, has announced the election of new officers and the appointment of directors for 1983.

Frank Kohlmeyer, executive vice-president of Realist, Inc., has been named chairman of the board at IMC; and William McGlone Jr., market manager at 3M Corp., has been elected president. John Hensel, an international director at 3M, has been elected vice-chairman of the organization; and Don Avedon, author of *Computer Output Microfilm*, will remain IMC's executive director. Elected treasurer was Michael Rothbart, chairman of Terminal Data Corp.

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Manufacturing Control System Handles Growth

(Continued from Page 61)

helped manufacturing project more accurate delivery dates and has cut down on the number of questions from customer service.

"Customer service can now go to a visual display terminal and see where an order is and how long it will be until the parts are shipped," LoSapio said.

With the Unis system, a planner can quickly look at the priority of each order and change the priority immediately if necessary.

Group Orders

The system also enables management to group orders within a given horizon to reduce setup costs. If several manufacturing orders use the same rubber or metal components, for example, the planner can schedule the shop to keep the same mold in a press to produce the pieces early for those orders. As orders are received, the premade parts can be removed from inventory.

On-time delivery, an important aspect of Lord's business, has improved, due primarily to a closed-loop MRP system.

"A closed-loop MRP system has helped us to manage inventory shipments and work load to meet company plans," Robert Barron, manager of materials, said.

"In the past, we averaged about $5 million in past due shipments a month, based upon our promised delivery dates. We have reduced that to less than $500,000 a month.

"After our first MRP run, we rescheduled $500,000 of production. We found we were making things we didn't even need," Baron said. "The MRP system has enabled us to grow and manage our inventory investment at the same time. That in itself is worth a lot."

When Lord went on-line, the accuracy of its inventory improved dramatically. At the end of 1981, it averaged 97%.

Thomas Quinn, controller of the Mechanical Group, added, "Now we just take the computer printout and audit it. We don't have to take a physical inventory for a large majority of our stockroom parts anymore, and that saves a lot of time for stockroom personnel. More than 2,000 stock transactions occur daily on the system."

With the on-line system, Lord is also finding parts in inventory that are obsolete. Every three months, inventory is checked for parts lacking activity during the previous 18 months.

The on-line system has also given Lord a better control on costs. The system not only tracks the costs of labor and raw materials, but it also keeps account of the different machines involved in making a product.

"When we work on an order we can establish the machines and tools needed to produce it, then we can amortize that asset cost in the product," Quinn said.

"We did standard product costing before, but we could only do it once a year. It now takes five to nine hours of processing and we do it every quarter. If we wanted, we could do it every month," he added. "By looking at every quarter, the company can see the effects that planning changes have on costs."

The cost information generated by the system serves the company in the area of corporate planning. The controllers take data from the system and feed it to the Sperry Financial Integrated Control System (Sufics) software package for economic modeling. From this data, a five-year plan is developed and updated every quarter.

"There's no doubt that we made a lot of progress relying on the closed-loop manufacturing control system," William R. Burrows, manager of industrial products manufacturing, said.

Noting that production is up "quite a bit," he said, "The key is that we have an integrated management system and we are headed toward a common goal. Our system produces a plan, but the trick is to follow that plan. We have been able to act on it and report back." Reporting back to the on-line system is important because it has provided the visibility needed to keep on top of production.

"We know in the morning what happened yesterday," Burrows asserted.

New applications include plans to use the Sperry system to simulate different manufacturing scenarios. Company engineers enter different variables into the system to determine how many people and how much material are needed to meet the proposed conditions.

With its emphasis on technology and research, it's not surprising that Lord has spent most of its time making production more efficient. The company has spent little time developing traditional accounting systems, but this will change ... and Sperry equipment and software are expected to help here, just as they helped improve production.

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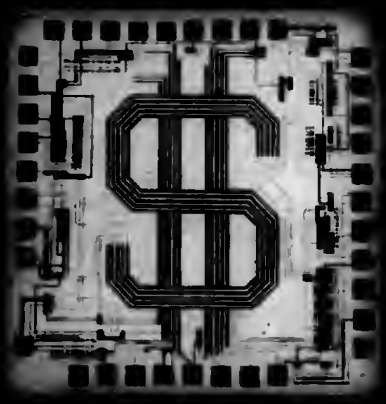

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THE TOTAL SPORTS NETWORK

Firm Finds Real Benefits of MRP During Implementation Process

By Ted Deziel
Special to CW‡

MINNEAPOLIS — The recent implementation of manufacturing resource planning (MRP) at Longyear Co. here has made it apparent that the real benefits of MRP result from the implementation process itself, rather than the use of a specific computer configuration or software package.

The MRP implementation process at Longyear began in May 1981 and continues today. So far, a production planning process has been developed where top management is involved in the monthly statement of the production plan. The production plan is accurately translated into inventory through MRP.

Accuracy of on-hand balances has improved as a result of cycle counting from 30% to over 96%. Accuracy in tracking parts due in and due out (open order accuracy) has improved from 71% to over 98%.

In addition, bill of material accuracy has been monitored and maintained at 98%. Availability of accurate, timely information throughout the company has also improved users' confidence in the systems and has generally created a more positive working environment. Finally, operating departments are sharing information that is centrally maintained rather than using independently maintained information. These benefits were achieved by using an implementation process based on four major principles.

Management Support

Much has been written about the importance of top management commitment in implementing MRP. At Longyear, the top management group followed up on a middle management suggestion to explore the benefits of MRP. After visiting companies that successfully used MRP, attending outside MRP courses and evaluating feedback from people throughout the company on MRP, top management committed itself to the MRP project.

This commitment was made in the face of the highest business level in Longyear's history. Without dwelling on details, it is sufficient to note that without solid top management support, the MRP project would not have happened.

MRP formal education was undertaken initially a full year before the project began. By May 1981, 19 people had attended a total of 35 outside MRP education courses. Another 17 outside courses were attended over the next year and a half.

The outside education assured that the project team members were all "singing from the same hymnal." Efforts could be directed toward the real issues, not the pros and cons of various approaches to MRP. In-house education was accomplished through use of a videotape program. Project team members set aside two hours a day for 2½ months to train as instructors on the tape program. The newly trained instructors then conducted classes for their departments. Everyone in the company was exposed to a minimum of two hours of education,

(Continued on Page 64)

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MRP Benefits Come From Implementation

(Continued from Page 63)

and many departments went through over 50 hours of formal education.

The education provided a good foundation for the detailed work that these people performed in MRP task groups. Shortly before the new system was in place, two weeks of training were given to familiarize all users with the mechanics of the system. Subjects covered during these sessions included reports, input forms and procedures and the use of CRTs.

Organization of the project team is the key element in the MRP implementation process. People selected for the project team will establish the implementation plan and make decisions on all major issues that arise during implementation. Just as important is the fact that the project team is the project as seen by others in the organization. A project team consisting of only management information systems personnel implies that the project is another data processing system, whereas a project team consisting of key user department members serves to define the project as a company system.

Longyear's MRP project team consisted of a cross section of managers:

- Production inventory control manager.
- Design engineering manager.
- Purchasing manager.
- Marketing manager.
- Data processing manager.
- General foreman.
- Materials manager.
- Assembly foreman.
- Manufacturing engineering manager.
- Plant manager.
- Accounting manager.

The composition of the project team established the view that this was a companywide system and that its success was the responsibility of the middle management group.

Project Manager

From this group, the materials manager was selected to serve as MRP manager. Since this position was full-time for the initial start-up period (1½ years), the duties of the materials manager were assumed by the production and inventory control manager. This arrangement provided the project team with a leader who had an excellent understanding of the systems and procedures that were in place as well as an established leadership position within the organization. It also reinforced the message that this was not just another DP system but a company system.

Once established, the project team identified the tasks involved in implementing MRP and met weekly to monitor progress.

Task groups were established to identify and accomplish specific tasks. A project team member would chair the typical task group, while the remaining task group members would be from departments closely involved with the activity being addressed. Task groups were established for these activities:

- Records accuracy.
- Bill of materials accuracy.
- Open order accuracy.
- Education and training.
- Computer software.
- Item analysis.
- Forecasting.
- Master production scheduling.
- Routing accuracy.
- Implementation.

The benefits that have resulted from the MRP system to date are a direct result of the many people involved in the task groups. All of the computer reports, forms and procedures that are now in place were designed and developed by the task groups and are supported enthusiastically by these end users.

DP support is as important to the MRP project as breathing is to living. Both functions are vital, both functions are assumed to be working properly and neither function is discussed much unless something goes wrong. Regardless of the MRP software that is purchased, some modification is inevitable. The implementation program at Longyear, in fact, encouraged users to design reports that would suit them.

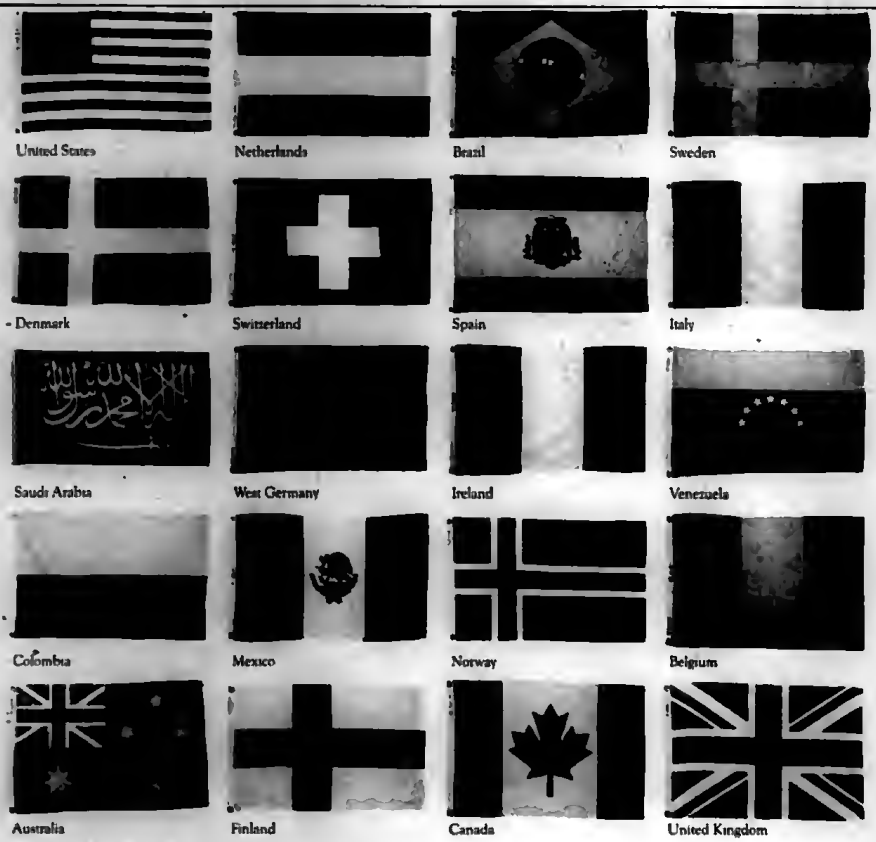
Once the system requirements were finalized, the purchased software package had to be modified and implemented as quickly as possible so that momentum was maintained.

While the software was being developed, the project team turned its attention to other activities such as training, preinstallation clean up and review of all data and finalization of new procedures. As far as the programming effort was concerned, no news was good news.

The software development effort was not very visible to most members of the MRP project team. However, it received a great deal of attention from the software task group. Weekly task group meetings were held to review progress against the schedule and to apply additional resources as required to remain on schedule. This type of DP support requires a user-oriented DP staff that is also technically competent.

The lead programmer/analyst in the Longyear project had transferred to DP from inventory control a few years before the MRP project began. His experience as a user and as a programmer was invaluable.

Deziel is DP manager at Longyear Co., Minneapolis.



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System Aids Steel Firm in Maximizing Efficiency

CLEVELAND — A major steel producer reported it has gained control over its inventories and shop scheduling with the aid of a manufacturing system. In addition, the system has helped maximize the efficiency of operations throughout the divisions and subsidiaries of its manufacturing group.

Republic Steel Corp., headquartered here, accounted for nearly 8% of all steel produced in the U.S. in 1981. Republic also supplies the fabricating divisions and subsidiaries of its manufacturing group.

Most of the business accounting and order entry functions of the Republic Manufacturing Group were designed and programmed in the early '60s. Some 10 years later, during a decentralization process, the group's computer operations were merged with the companywide Business Systems Group data centers — five data centers in all.

In 1979, representatives from corporate, group and divisional levels were brought together to form a task force that would identify computer systems requirements within the Manufacturing Group and develop a plan to meet those requirements. Republic had felt the need for a better computer system, one that would maximize the efficiency of operations throughout the divisions and subsidiaries of the Manufacturing Group.

Six months later, a study by the task force indicated it would cost $8 million and take five years to achieve the necessary levels to satisfy the group's business information processing needs. The figures were based on in-house design and programming of the applications software.

In April 1980, Nils H. Jensen, a former materials manager for a fabricating division of a Philadelphia steel company, was hired as group director of systems, material and traffic to coordinate all of the group's systems activities and development.

"At that time, we had no systems people in the division," Jensen said. "We had no state-of-the-art expertise, we had a definite lack of information in the group and we didn't have the time to develop a system on our own."

The Solution

"We needed a system," Jensen continued, "that was flexible enough to install in all of our divisions." So began the criteria for the applications software. "It had to cover all aspects of the business, essentially materials requirements planning [MRP]. The software company had to have hands-on experience to assist in the installation of the system. We had to teach the divisional personnel not only the system but also the technique. For instance, how do you capacity-schedule for a manufacturing plant?"

Jensen, with the help of managers from the divisions, set out to evaluate eight major software systems that appeared to meet the group's requirements. Using the standard Wight and Landvater *MRP Software Evaluation Report* as a guide, six of the software systems were quickly eliminated from competition.

The system finally chosen was Xerox Corp.'s Computer Services' Manufacturing System. Fully integrated and interactive, the Xerox Manufacturing System is an on-line access system that allows for the immediate updating of all appropriate files each time a transaction is made.

Originally developed for Xerox remote computer services customers, the software can run on IBM computers and their software-compatible equivalents. The software is modular, allowing a user to pay for only the applications needed. There are options that enable the software to be customized to specific requirements. And for further modifications, on-line system programming techniques have been developed for customer use. Republic's Manufacturing Group uses the Xerox system without modification.

Initial Profile

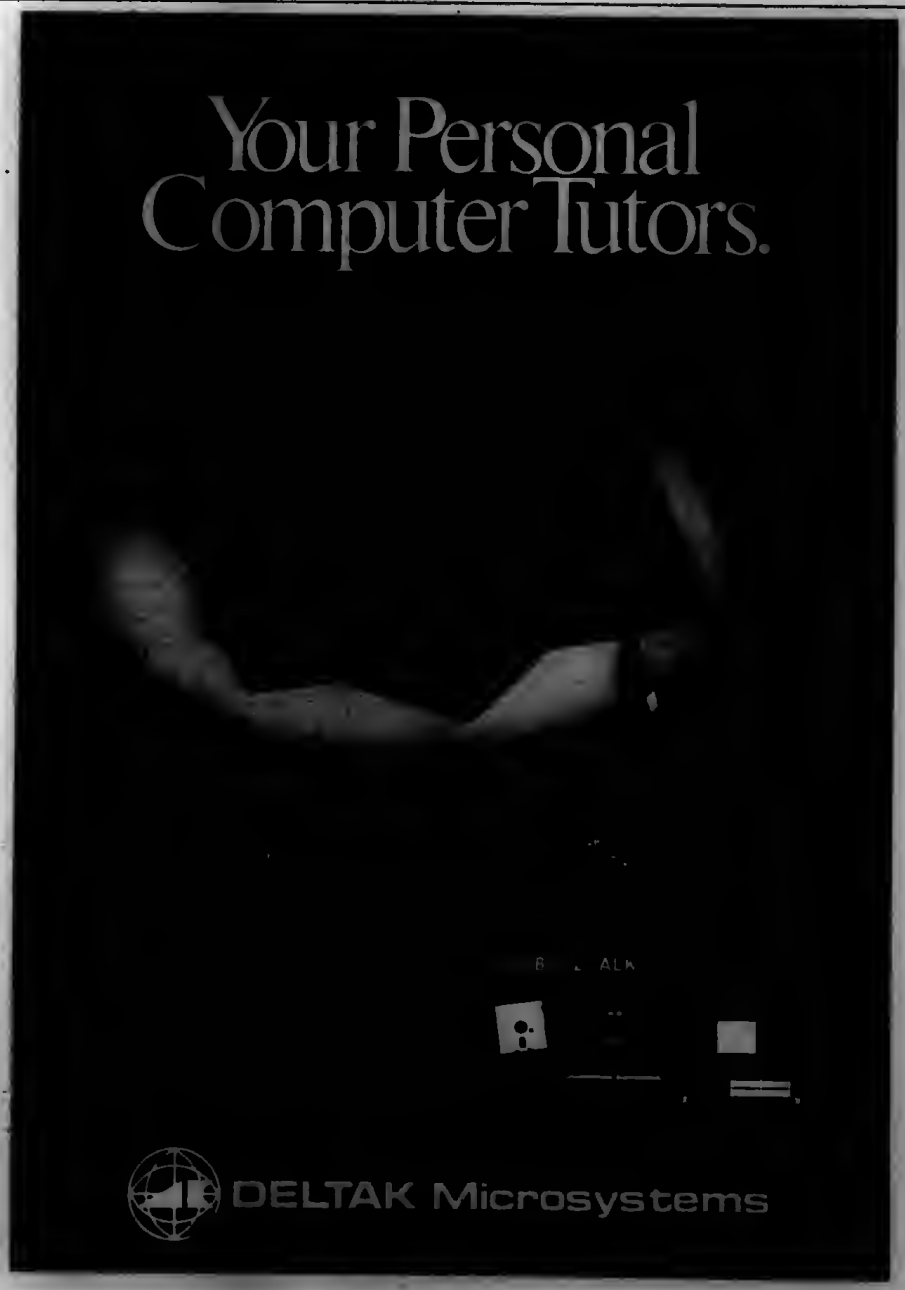
In April and May 1981, Xerox Computer Services personnel performed an initial profile of a specific Republic division that would serve as a road map for installation of the entire system groupwide.

The objective of the profile was to determine the way the options in each application would be set to insure that the system would operate exactly in the manner needed by the division.

In mid-June, a Xerox advisory consultant defined the division's data, and Republic began loading it. During this period, Xerox personnel did more than just install the system.

Xerox Computer Services provided half-day and one-day training sessions to the group's selected people on each application. They also provided an option called Remote Computer Services. With this option, Republic's Manufacturing Group was able to try out the applications before making a final commitment.

(Continued on Page 66)



'Bruce Has Degrees in Engineering and Computer Sciences, and He Still Can't Sink a Four-Foot Putt.'

Firm Gets Manufacturing System

(Continued from Page 65)

Using the services option, the manufacturing system was implemented through computer terminals in Republic'a offices. Republic now had on-line access to computers at Xerox data centers where the division files and software programs were stored.

Move In-House

After this evaluation and usage period, the software and data base were moved from the Xerox computer to Republic'a' computer, establishing an in-house system.

"The installation of the data base," Jensen said, "along with Xerox manufacturing software, was completed over a weekend with no problem. The move went so smoothly that on Monday — when the Storage Rack Division's users came up on the in-house system — it was imperceptible that they had moved from the Xerox data center in Los Angeles to their own in-house system at Warren, Ohio."

The Republic Manufacturing Group is now proceeding to put other divisions and subsidiaries on the Xerox aystem. The applications used by the Manufacturing Group are general ledger, order management, cost planning and control, MRP, master production scheduling, production control, physical inventory, payroll and accounts payable.

Cost Reduction

Although the task force said it would cost $8 million and take five years to develop an in-house system, by purchasing the Xerox Manufacturing System the software cost was reduced to a fraction of the $8 million, and the time to install all three divisions was cut in half, according to Jensen.

"If we had tried to develop a total system ourselves, we would have found ourselves designing a system for each division. That would have demanded constant maintenance. In fact, with our old system we were averaging between 15 and 20 calls a week for maintenance. Now we get between one and two calls every week. As you might expect, most of those calls are related to scheduling reports and print jobs."

Also; with the Xerox Manufacturing System's on-line capability and ease of access to date, Republic can extract information quickly where it used to take two weeks.

Manufacturing Impact

"This system has certainly improved our manufacturing operations. We now have immediate control over inventories and the first opportunity for us truly to schedule a ahop. Once control was established, we saw an immediate drop in inventory and an improvement in productivity," Jensen said.

"The Xerox system also provides us with additional data not previously available and provides it on a very timely basis. We plan to provide a weekly financial rundown on each division and subsidiary. Since all of the applications are installed and integrated, financial reporting becomes a result of everyday transactions," he added.

The group utilizes another Xerox system option, the Reporter. It is a management display tool that ehables a user to fashion custom report formats according to apecific data needs.

Turnaround Document

"It's a turnaround document," Jensen said, "that enables the group to reconcile inventory within 24 hours of completion, as opposed to two weeks in the past. Another report made possible by the Reporter, a dispatch list, lets foremen schedule a unit to meet promised deliveries. It also assists in manpower planning."

"We totally streamlined the division'a operations. I think that the experience of the training sessions and inatalling a major computer system made all personnel more aware of facets of the business outside their own normal functions. It tuned everybody into the objectives of the division," Richard McGauran, materials manager of the Storage Disk Division, said.

"In a nutshell, the Xerox system was the only software on the market that did everything we needed. Some of the other ayatems we had evaluated had different connecting applications, but none offered an entire manufacturing and financial package that revolved around general ledger — the bottom line of any company — as the Xerox system does. The tools were there to do everything we wanted. And then some," Robert S. Collier, group aytems manager, said.

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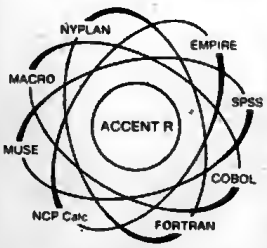

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Firm Finds Control Systems Need Business Plan

By Walter Gartman
Special to CW‡

SHEBOYGAN, Wis. — The Vollrath Co. here installed an informal but computer-related shop control system in the early 1960s. Known as the Integrated Manufacturing Information and Control (Imiac) System, it was the traditional reorder point system — a stand-alone style driven by an exponentially smoothed forecast with most emphasis on shop floor control.

The "Manufacturing System" in the system's name emphasized that all of the problems were manufacturing-related — manufacturing that takes place on the shop floor. In the process of installing Imiac, timekeepers and order-posting clerks were supplanted by an IBM 357 which — with its punch cards and badge readers — created an output card used for order tracking, payroll processing and some job tracking.

But in this informal environment, unlinked to any other computer-generated system within Vollrath and without the essential feed of an overall business plan, all Imiac did was discover mistakes sooner.

As more manufacturing facilities, products and demands were added over the next 15 years, this informal shop floor control was patched and extended in Band-Aid fashion, making existing systems inadequate and complex and leading to a kind of decay.

Overhaul Time

By 1979, it became clear that it was time to overhaul the manufacturing systems and replace them with state-of-the-art applications. Vollrath's current formal shop floor control system is part of the development of Closed Loop Accountability Management Planning System (Clamps). Clamps links all integrated management planning systems: business planning, marketing and manufacturing planning, master scheduling and materials requirements planning. These are prerequisite to and set the pace and priority objectives for shop floor control, ensuring both proper foresight and feedback.

This interaction of all computer-assisted facets of planning and manufacturing ultimately allows Vollrath plant supervision to work through a sensible, paced and practical schedule. As a result, shop floor schedulers and expediters have been taken off the floor and reassigned. The responsibility for meeting due dates is in the hands of the supervisors.

In its on-line, real-time interfacing with master production scheduling (MPS) and material requirements planning (MRP), the shop floor control system also serves payroll and supplies accounting with up-to-date transactions with burden applications.

It updates inventory accounting with current requisitions and receipts and gives exact status of any production order as of the last transaction.

Real Issue

But this interface of the total computer-aided Vollrath systems (particularly the integration of shop floor control) did not just happen. It involved great labor, trauma, planning, mistakes, doubts, time, money, patience and, above all, a project team with the commitment of top management.

Managing change was the real issue. So from the beginning, education was as important as the systems development itself.

Intrinsic to interfacing shop floor control systems with other computer-aided management systems was the formation of the best possible project team. The team had to be able to anticipate potential problems down the road and be committed to accuracy and a realistic timetable. Even more important was the commitment to educate Vollrath's work force, realizing that they face not only technical changes but also

(Continued on Page 70)

Guide Indexes DP Publications

PHOENIX — Applied Computer Research, Inc. has announced the availability of the "1982 Cumulation of the Computer Literature Index." The 313-page reference source is a guide to the literature in the computer field published during 1982.

Covering nearly 200 periodicals and many DP-related books and conference reports, the index focuses on material pertaining to the practicing end of the DP profession as opposed to the theoretical or engineering side.

The subject-indexed guide features electronic data processing administration, applications of computer systems, communications, the computer industry, technology, personnel and training, equipment selection, software and programming, systems analysis and DP techniques, the publisher said.

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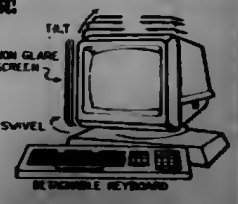

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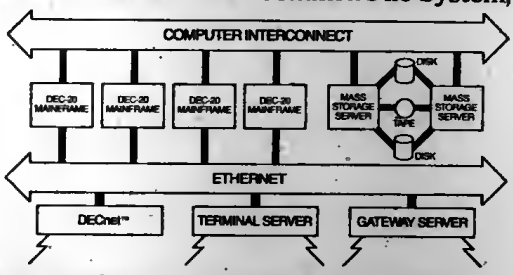

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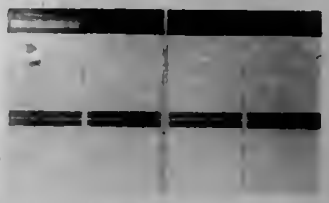

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Firm Finds Control Systems Need Business Plan

(Continued from Page 67)
deep social changes.

Once the team had been assembled preliminary research began. First, a realistic assessment of in-house needs was made. Personal interviews were found to be most effective. Second, the approaches of other successful systems were studied.

A close examination of other in-house computer-aided management systems was the third step carried out. In other words, was the proposed plan going to be compatible with Vollrath's existing systems? Finally, recommendations based on the above three items were needed. A decision had to be made: Should the project continue or should it be killed?

Design Finalized

If the project was to be continued, systems design had to be finalized with the systems analyst serving as liaison between the project staff and the DP department programmers.

At this point the project team was split. The systems people on the team took care of technical development. The project leader went into preeducation development. This meant preparing study materials for people at all levels, including samples of what reports would come off the computer, directions on how to use reports and an explanation of the logic of the systems development. The plan was fine-tuned with the help of the supervisors.

At this point it should be kept in mind that one of the major reasons such projects never get completed is that there are too many detours. The team had to make logical changes but could not tinker forever.

Final Step

The final step in the project was the organization of an interface to serve labor and management. In a union shop there are the considerations of early involvement of union leaders and upfront orientation of these representatives. But even in a non-union situation there must be early involvement of both management and the work force.

An open discussion of the project with shop spokesmen or union management will help dispel lingering fears that the company is trying to "pull something off."

Once the conversion to the new system is made, problems will arise; they should be expected. At Vollrath, three months of reexamination and problem-solving were necessary to bring people as well as technology on-line.

Gartman is corporate director of materials management for the Vollrath Co.

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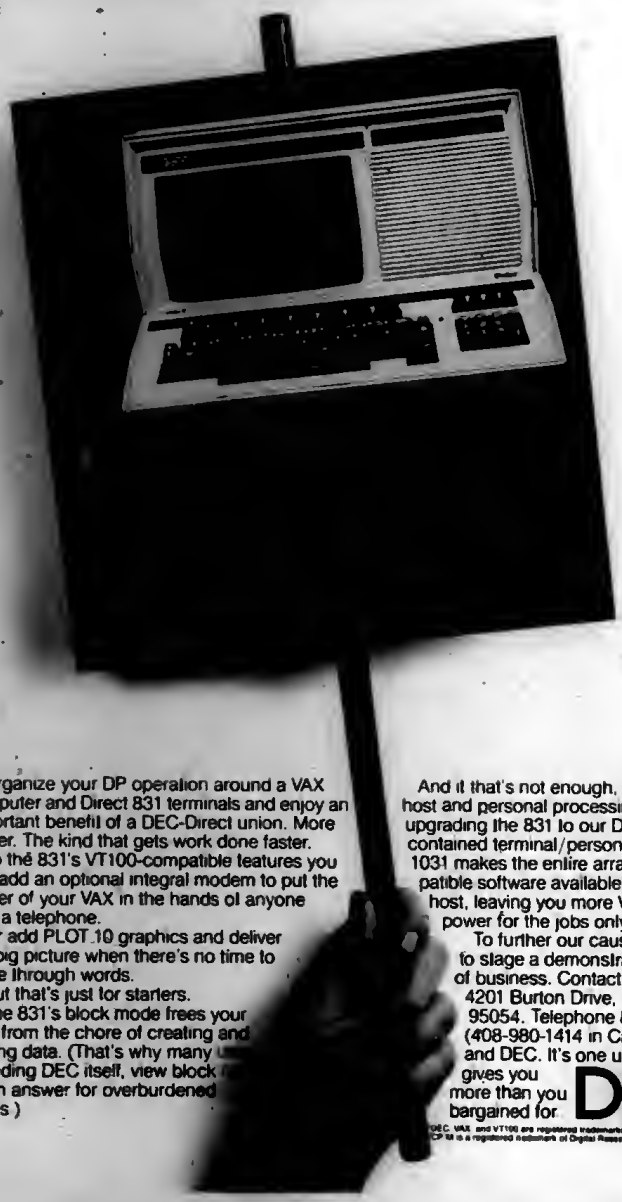

Organize your DP operation around a VAX computer and Direct 831 terminals and enjoy an important benefit of a DEC-Direct union. More power. The kind that gets work done faster.

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LAS VEGAS — A Professionals Microcomputer Symposium for future users of small business computers will take place here June 23-25.

Jointly sponsored by Timberline Systems, Inc. and Timberline Users Group, the symposium is being held primarily for accountants who recommend microcomputers to others or are planning to acquire their own systems.

The agenda will include sessions on microcomputers and their operating systems, applications software, productivity tools, "vertical market" vs. general accounting software, data communications, data bases and other topics.

The full registration fee is $290. The exhibits-only fee is $40.

More information on the symposium is available from the symposium coordinator at Timberline Systems, Inc., 7180 S.W. Fir Loop, Portland, Ore. 97223.

'Why Are All Letters Different?'

Calendar

Week of May 29

June 1, New York — **Planning for XA.** Contact: Techtran, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

June 1-3, Philadelphia — **Data Communications: An Introduction to Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held June 6-8 in Atlanta.

June 1-3, Los Angeles — **Data Base Management Systems: A Comparative Analysis of General-Purpose Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 1-3, New York — **The Personal Computer: Strategies for Managing.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 1-3, New York — **Evalnating, Selecting and Using Computer Software Packages.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 1-3, San Francisco — **Microcomputer Systems: A Guide to Selection and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 1-3, Chicago — **Successful Use of Minicomputers.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 1-3, Boston — **Computer Performance Measurement and Capacity Planning.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 1-3, Chicago — **Practical Data Security: Implementation and Management.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 1-3, Columbus, Ohio — **VM Structure, Flow and Tuning.** Contact: Education Coordinator, Goal Systems International, 5455 N. High St., Columbus, Ohio 43214.

June 2, Boston and San Francisco — **SNA Trends '83 — The Direction of IBM Communications.** Contact: George Haskell, Communications Solution, 992 S. Saratoga-Sunnyvale Road, San Jose, Calif. 95129.

June 2-3, Los Angeles — **Local-Area Networks: Selection Guidelines.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 2-3, New York — **Data Facility Products.** Contact: Techtran, 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

June 2-5, Diamond Bar, Calif. — **Solving Client Problems.** Contact: Donald J. Bushor, COM Consultants, P.O. Box 4132, Diamond Bar, Calif. 91765.

Week of June 5

June 5-8, Scottsdale, Ariz. — **Data Entry Management Association (Dema) Mini-Conferences and Professional Growth Seminars.** Contact: Marilyn S. Bodek, Dema, P.O. Box 3231, Stamford, Conn. 06905.

June 6-7, Boston — **Digital PABX.** Contact: The American Institute For Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

June 6-7, New York — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

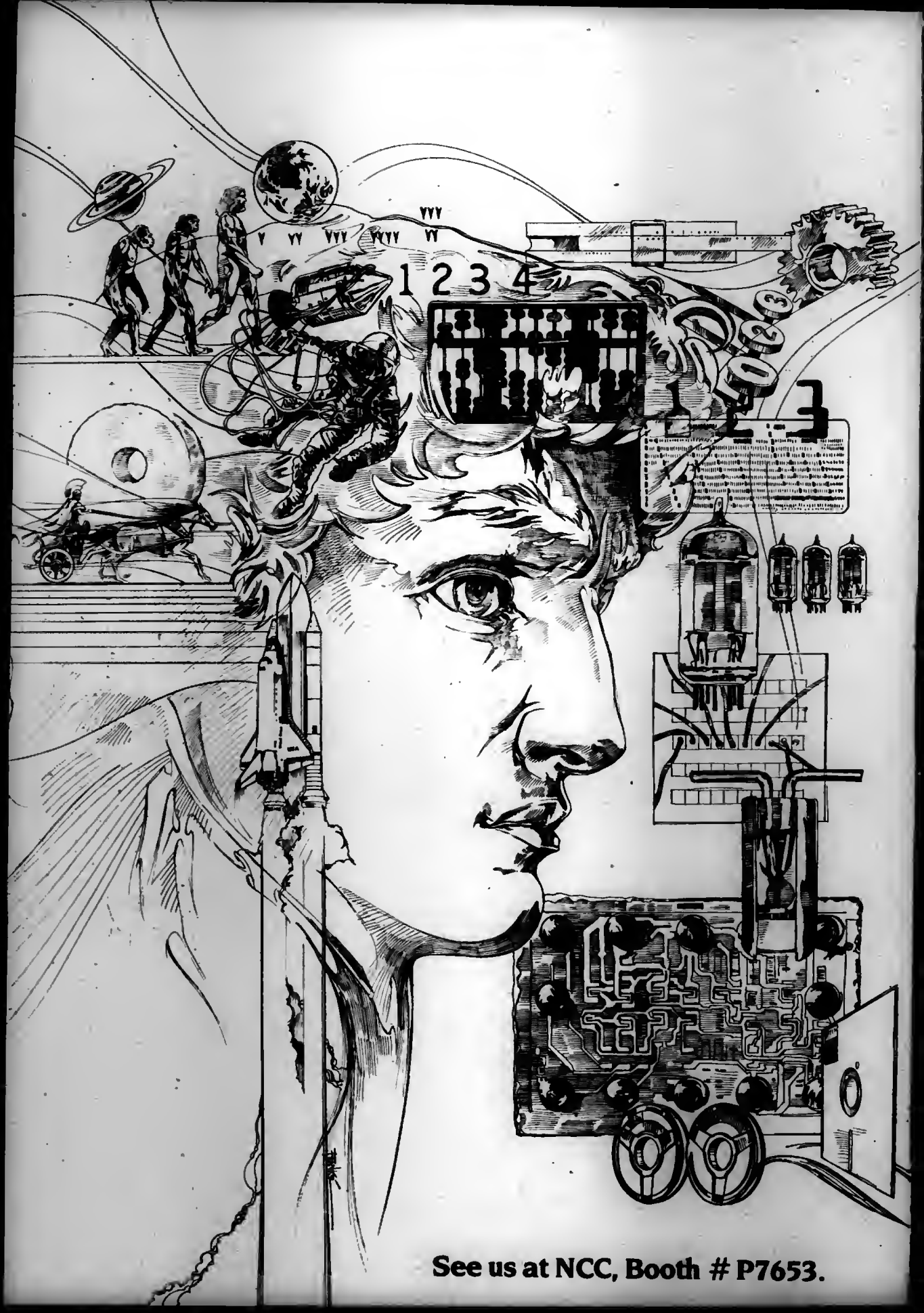
June 6-8, Baltimore — **Fifth Annual National Educational Computing Conference.** Contact: Dr. Doris Lidtke, Department of Mathematics and Computer Science, Towson State University, Baltimore, Md. 21204.

June 6-8, Washington, D.C. — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

June 6-8, New York — **CEO Word Processing.** Contact: Data General Corporate Educational Services, 400

(Continued on Page 74)

1983 Summer Conference, July 12-15, 1983,
Toronto, Canada



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Calendar

(Continued from Page 71)
Computer Drive, Westboro, Mass. 01580.

June 6-8, Scottsdale, Ariz. — **Data Entry's Place in the Electronic Office.** Contact: Data Entry Management Association, P.O. Box 3231, Stamford, Conn. 06905.

June 6-8, Anaheim, Calif. — **VAX/VMS Systems.** Contact: Raxco, Inc., Seminar Registrar, Suite 200, 6520 Powers Ferry Road, Atlanta, Ga. 30339.

June 6-8, Houston — **Data Communications Systems.** Contact: Center for Advanced Professional Education, 11928 N. Earlham, Orange, Calif. 92669.

June 6-8, Atlanta — **Data Base Management Systems: Concepts and Guidelines.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 6-8, Atlanta — **Systems Analysis and Design: Concepts and Effective Practice.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 6-8, New York — **Introduction to Office Automation: Concepts, Technologies and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 6-9, New York — **CICS/VS Logic and Debugging.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, 2 Executive Drive, Fort Lee, N.J. 07024.

June 6-9, Los Angeles — **Structured Systems Design/ Structured Program Design Combined Course.** Contact: Gayle Giesecke, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604. Also being held June 6-10 in Houston.

June 6-10, New York — **CICS/VS Command-Level Programming.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

June 6-10, Washington, D.C. — **Workshop in Data Communication for Microcomputers.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

June 6-10, Washington, D.C. — **Structured Maintenance.** Contact: Gayle Giesecke, Ken Orr and Associates, Inc., 1752 Gage Blvd., Topeka, Kan. 66604.

June 7-8, Schaumburg, Ill. — **Second Annual Conference on Office Antomation: A Management Focus to Improve Productivity.** Contact: Data Communications, Special Projects Conference Management Center, c/o Information Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481.

June 7-8, Arlington, Va. — **Erasable Material for Mass Storage Retrieval Applications.** Contact: The International Society for Optical Engineering, P.O. Box 10, Bellingham, Wash. 98227.

June 7-9, College Park, Md. — **Planning for Office Automation.** Contact: University of Maryland, Center for Adult Education, College Park, Md. 20742.

June 7-9, Dallas — **Ada Launch '83 Seminar.** Contact: Steve Goings, Computer Thought Corp., P.O. Box 61028, Dallas, Texas 75261.

June 7-10, Chicago — **Vsam for IMS Programmers.** Contact: Software Information Services, P.O. Box 4132, Bellevue, Wash. 98009.

June 7-10, Los Angeles — **Digital Communication.** Contact: Rnth Dordick, Integrated Computer Systems, Inc., 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

June 7-10, San Jose — **Speech Synthesis and Recognition for Voice Input/ Output.** Contact: Ruth Dordick, Integrated Computer Systems, Inc., 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

June 8-9, Arlington, Va. — **Optical Disks Systems and Applications.** Contact: The International Society for Optical Engineering, P.O. Box 10, Bellingham, Wash. 98227.

June 8-10, New York — **Computer Operations Management: Effective Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 8-10, Boston — De-

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Calendar

veloping Automated Human Resource Management Systems. Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

June 8-10, Arlington, Va. — **Personal Computers and Networking.** Contact: Herb Stern, Center for Advanced Professional Education, Inc., 11928 N. Earlham, Orange, Calif. 92669.

June 8-10, New Brunswick, N.J. — **Data Communication Systems.** Contact: Center for Advanced Professional Education, 11928 N. Earlham, Orange, Calif. 92669.

June 8-10, Boston — **Fundamentals of Data Communication.** Contact: American Management Association, 135 W. 50th St., New York, N.Y. 10020.

June 9-10, Arlington, Va. — **Nonerasable Media.** Contact: The International Society for Optical Engineering, P.O. Box 10, Bellingham, Wash. 98227.

June 9-10, Washington, D.C. — **Data Administration: Development and Practice.** Contact: Barnett Data Systems, Inc., 19 Orchard Way N., Rockville, Md. 20854.

June 9-10, New York — **CEO System Support.** Contact: Data General Corp. Educational Services, 4400 Computer Drive, Westboro, Mass. 01580.

Week of June 12

June 12-16, Salt Lake City, Utah — **Government Management Information Sciences 1983 Conference.** Contact: William Allen Dunn, 151 S. 2100 St., Salt Lake City, Utah 84115.

June 13-14, Chicago — **Data Communications: Advanced Concepts, Products and Services.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 13-14, Boston — **Local-Area Networks: Selection Guidelines.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 13-14, Chicago — **Structured Maintenance: Reducing Costs With a New Methodology.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 13-15, New York — **Structured Testing: Tools and Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 13-15, Chicago — **Evaluating Security Software: Choosing the Right Package.** Contact: Computer Security Institute, 43 Boston Post Road, Northborough, Mass. 01532.

June 13-15, Boston — **DP Disaster Recovery Seminar.** Contact: EDP Security, 181 W St., Waltham, Mass. 02154.

June 13-15, Upland, Ind. — **The 16th Annual Association of Small Computer Users in Education Conference.** Contact: Dr. Wally Roth, Department of Information Science, Taylor University, Upland, Ind. 46989.

June 13-15, Dallas — **Introduction to Office Automation: Concepts, Techniques and Applications.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 13-15, Chicago — **Word Processing Systems: Planning, Design and Operations.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 13-16, New York — **Vtam: From Start to Finish.** Contact: Dianne Halper, On-Line Software International, Inc., Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

June 12-17, Malibu, Calif. — **Computer: The University Computer Challenge.** Contact: Summer Computer Literacy Institute, Pepperdine University, Malibu, Calif. 90265.

June 14-17, San Diego — **Local-Area Networks.** Contact: Ruth Dordick, Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

June 14-18, Paris — **Micro Expo '83.** Contact: Christine Mullings, Sybex, 4 Place Felix-Eboue, 75583, Paris, France.

SEE US AT NCC/83 BOOTH P7838

Users Rate Magnuson Systems First, CDC Last

(Continued from Page 1)

NCR Corp., Burroughs Corp., Sperry Corp. and Honeywell claimed the seventh, eighth, ninth and tenth spots in terms of user satisfaction, respectively.

The highest rated IBM systems, according to this year's ratings, were those in the 3080 series, which ran fifth behind Magnuson's M80, DEC's Decsystem-20, Amdahl's 470 and the Decsystem-10. IBM's 360s and 370s, along with its 3033, 4341, 4331, 3031 and 3032, were scattered throughout the middle of the user satisfaction list, with the 8100 finishing last.

Despite its extremely weak showing, 85% of the 8100 users told Datapro they have no intention of trading in their systems for those of another vendor over the next year. Only 7% plan to replace their systems with one made by another vendor; the rest said they will wait for upgrades from IBM.

Likewise, a high percentage of 4341, 4331, 3033 and 3080 users have no immediate plans to swap their systems for machines made by IBM competitors. However, 43% of the 370 users, 28% of the 3031 and 3032 users and 20% of the 360 users polled said they will trade in their systems for more powerful IBM replacements sometime within the next year.

Some of the major reasons why CDC broke Honeywell's three-year stranglehold on last place was the difficulty its users had in programming and operating their systems, the Datapro survey said. CDC placed last in those two categories.

Curiously, despite their programming and operating difficulties, these same users said they have no intention of replacing their systems with those made by the competition.

The users even gave CDC a vote of confidence by unanimously agreeing the vendor had delivered all the necessary software on time, tying both IPL and Magnuson for that distinction.

Important Questions

Two vital questions posed to users in the survey were "Did the system do what you expected it to do?" and "Would you recommend it to another user?" A little more than 91% said their systems did live up to their expectations, 4% reported their systems fell somewhat short of what they had expected and 5% said they "hadn't decided."

Comparing individual vendors against each other on this question, IPL, NAS, Amdahl and Magnuson swept top honors with 100%, 100%, 98% and 95%, respectively, of their users saying their systems did what they expected them to do.

In answer to whether they would recommend their systems to other users, 80% of the respondents said yes. However, the only group of users that unanimously said they would endorse their vendor's systems to other users was IPL. The two firms with the second and third highest number of endorsements were Amdahl (96%) and Magnuson (89%).

Asked to identify their major applications, this year's participants identified the same top six applications as last year's respondents — accounting/billing, payroll/personnel, order processing/inventory control, sales/distribution, purchasing and manufacturing.

Insurance moved up to tenth place, replacing education.

The vast majority of users reported that their primary source of software was in-house personnel. Most users said they prefer generating software in-house because they can better tailor it to meet a specific customer's needs.

Most Systems Purchased

While the majority of users reported that they purchased their systems, a healthy number of lessees were also represented in this year's survey. The processor with the widest discrepancy between the number of machines purchased and leased is IBM's 360; 90% of its users have purchased their systems and 10% are leasing them.

The only other two IBM systems where 50% or more users have purchased their systems are the 370 (51.5%, with 38% leasing from third parties) and the 3080 series (50.9%, with 30.7% leasing from third parties).

Asked whether their systems are located in either a centralized or distributed processing environment, the overwhelming majority of users said their systems are central processing installations. The only system used more as a distributed processor than as a central processor is IBM's 8100.

How Datapro Reached Results

DELRAN, N.J. — The results of Datapro Research Corp.'s 1983 survey of computer systems are based on returns from a mailing of 15,033 questionnaires sent to a cross-section of *Computerworld* readers. Users were asked to rate their mainframes and minicomputers in 14 different categories.

Of the 15,015 questionnaires sent out, 4,329 responses were received from 4,103 respondents, a return rate of 27%. Datapro judged 511 of the 4,329 returns invalid, leaving a total of 3,818 vaild responses from 3,592 users with a total of 4,957 installed systems.

Copies of the "1983 User Rating of Computer Systems" can be obtained for $25 from Datapro at 1805 Underwood Ave., Delran, N.J. 08075.

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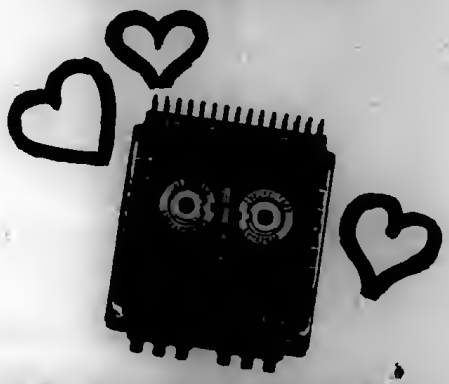

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Users Rate Their Mainframes . . .

Survey Item \ Manufacturer and Model	Amdahl 470 Series	Burroughs B 2800, B 3800, & B 4800	Burroughs B 2900 & B3900	Burroughs B 5900 & B6900	Burroughs B 6700 & B7700	Burroughs B 6900 & B7800	Control Data All Models	Digital Equipment DECsystem—10
[illegible]	48	39	27	9	9	20	6	14
[illegible]	23	34	37	9	16	35	9	30
[illegible]	38.8	39.6	35.4	34.0	35.3	46.6	48.7	64.6
Plans for system replacement in 1983 (%)								
Yes, Same Manufacturer	15.22	15.38	7.41	0.00	12.50	15.79	0.00	14.28
Yes, Vendor Unknown	17.39	7.69	0.00	0.00	25.00	0.00	0.00	0.00
Yes, Different vendor	2.17	0.00	0.00	0.00	0.00	10.53	0.00	0.00
No	65.22	76.93	92.59	100.00	62.50	73.68	100.00	85.71
[illegible] (%)								
[illegible]	71.74	62.91	44.44	33.33	75.00	35.00	33.33	85.71
[illegible]	42.40	72.00	74.07	100.00	62.50	65.00	50.00	85.71
[illegible]	23.91	7.69	7.40	0.00	0.00	15.00	0.00	7.14
[illegible]	70.61	60.00	55.56	44.44	50.00	45.00	50.00	50.00
[illegible]	60.87	60.00	51.85	44.44	12.50	40.00	16.67	35.71
[illegible]	41.30	7.69	40.10	33.33	0.00	15.00	16.67	7.14
[illegible]	30.43	34.63	35.00	44.44	25.00	35.00	0.00	28.57
[illegible]	28.91	7.69	33.33	44.44	75.00	65.00	0.00	35.71
[illegible]	30.00	11.54	22.22	11.11	0.00	0.00	0.00	14.28
[illegible]	[illegible]	3.85	18.52	33.33	0.00	0.00	0.00	0.00
Significant Problems (%)								
Computer proposed by vendor was too small	4.35	7.69	0.00	11.11	12.50	20.00	0.00	7.14
Installation of equipment was late	2.17	38.46	37.04	11.11	0.00	35.00	0.00	7.14
Delivery of required software was late	2.17	15.38	14.81	0.00	12.50	10.00	0.00	21.43
System costs (for hardware, vendor-supplied software, support) exceeded the expected total	6.52	11.54	14.81	22.22	25.00	5.00	0.00	7.14
Vendor did not provide all the promised software or support	4.35	23.08	11.11	33.33	12.50	15.00	0.00	14.28
Program/data compatibility not what vendor promised	0.00	3.85	0.00	11.11	12.50	5.00	0.00	0.00
Terminals/peripherals compatibility not what vendor promised	2.17	0.00	0.00	0.00	12.50	0.00	0.00	0.00
Vendor enhancements/changes to hardware/software hard to keep up with	4.35	26.92	11.11	33.33	25.00	15.00	16.67	7.14
Equipment is excessively noisy	4.35	3.85	7.40	0.00	25.00	5.00	16.67	14.29
Power and/or cooling requirements are excessive	8.70	7.69	0.00	0.00	62.50	25.00	50.00	21.43
[illegible]	3.37	3.00	3.56	3.00	3.63	3.50	2.83	3.77
[illegible]	3.57	3.54	3.36	3.33	3.38	2.50	3.30	3.43
[illegible]	3.17	3.00	3.00	2.75	3.00	2.00	3.00	2.93
[illegible]	3.41	3.00	3.15	3.00	3.00	3.00	3.30	3.17
[illegible]	3.61	3.50	3.00	3.75	3.75	2.33	3.00	3.17
[illegible]	3.30	3.13	3.41	3.75	3.00	3.25	2.83	3.30
[illegible]	2.96	3.17	3.27	3.33	3.63	3.10	3.07	2.73
[illegible]	3.00	1.85	2.15	3.00	3.25	1.95	3.00	3.00
[illegible]	3.11	3.00	3.50	3.44	3.63	3.40	3.00	3.71
[illegible]	3.13	3.15	3.15	3.33	3.38	3.11	3.17	3.14
[illegible]	2.97	3.00	3.00	2.71	3.30	3.00	3.25	2.76
[illegible]	3.00	3.37	3.19	3.11	3.38	3.38	3.00	3.00
[illegible]	3.00	3.00	3.19	2.78	3.00	3.11	3.00	3.00
[illegible]	3.00	3.00	3.03	3.11	3.00	3.00	3.00	3.30
Did the system do what you expected it to do? (%)								
Yes	97.78	96.15	88.89	33.33	87.50	80.00	83.33	92.86
No	0.00	3.85	3.70	22.22	12.50	15.00	0.00	7.14
Haven't decided	2.22	0.00	7.41	44.44	0.00	5.00	16.67	0.00
Would you recommend system to another user? (%)								
Yes	95.56	92.40	77.78	55.56	75.00	95.00	66.67	96.30
No	2.22	3.85	3.70	0.00	25.00	15.00	33.33	3.33
[illegible]	2.22	7.69	18.52	44.44	0.00	20.00	0.00	3.30

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Survey Item \ Manufacturer and Model	Digital Equipment DECSYSTEM—20	Honeywell Level 62 & 64	Honeywell Level 66 & 68	Honeywell DPS 7 & DPS 8	IBM System/360	IBM System/370	IBM 8100	IBM 4331
No. of User Responses	24	20	20	17	[illegible]	[illegible]		
No. of Systems Represented	58	41	[illegible]	23	[illegible]	[illegible]		
Avg. Life of System (Mos.)	34.6	50.6	[illegible]	[illegible]	[illegible]	[illegible]		
Plans for system replacement in 1983 (%)								
Yes, Same Manufacturer	0.00	10.53	8.00	0.00	20.00	43.88	7.14	14.12
Yes, Vendor Unknown	0.00	10.53	4.00	0.00	40.00	6.35	7.14	1.76
Yes, Different vendor	4.17	15.43	5.00	5.88	0.00	2.38	0.00	0.88
No	95.83	80.53	80.00	94.12	40.00	47.62	85.71	83.53
Significant Advantages (%)								
Users are happy with response time	45.83	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
System is easy to expand/reconfigure	62.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
System costs were less than expected	12.50	5.13	[illegible]	[illegible]	[illegible]	[illegible]		
Programs/data carried over from older systems are compatible, as vendor promised	50.00	35.00	[illegible]	41.18	[illegible]	[illegible]		
Terminals/peripherals carried over from older systems are compatible, as vendor promised	35.00	5.13	12.50	11.76	[illegible]	[illegible]		
System is power/energy efficient	20.83	10.30	12.50	[illegible]	[illegible]	[illegible]		
Productivity aids help us keep programming costs down	54.17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Data base language is efficient and effective	25.17	0.00	[illegible]	[illegible]	[illegible]	[illegible]		
Delivery and/or installation of equipment was ahead of schedule	16.67	5.13	[illegible]	[illegible]	[illegible]	[illegible]		
Delivery of required software was ahead of schedule	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Significant Problems (%)								
Computer proposed by vendor was too small	16.67	16.38	20.00	5.88	0.00	3.17	8.67	11.70
Installation of equipment was late	5.33	20.51	4.00	17.88	0.00	0.76	33.33	4.68
Delivery of required software was late	12.30	12.82	15.00	17.65	10.00	3.87	20.00	5.88
System costs (for hardware, vendor-supplied software, support) exceeded the expected total	5.33	25.64	12.00	29.41	10.00	10.32	13.33	11.11
Vendor did not provide all the promised software or support	5.33	23.08	32.00	23.53	30.00	1.59	26.67	8.77
Program/data compatibility not what vendor promised	4.17	2.56	8.00	5.88	10.00	0.00	6.67	4.08
Terminals/peripherals compatibility not what vendor promised	0.00	2.56	4.00	5.88	0.00	0.76	6.67	2.34
Vendor enhancements/changes to hardware/software hard to keep up with	5.33	7.69	24.00	11.76	10.00	7.14	40.00	21.08
Equipment is excessively noisy	20.83	16.38	8.00	5.88	0.00	4.76	0.00	0.58
Power and/or cooling requirements are excessive	12.30	15.38	4.00	11.76	40.00	37.30	0.00	2.34
System Ratings (4.0-1.0)								
Ease of Operation	3.71	3.10	3.10	[illegible]	[illegible]	[illegible]		
Reliability of Mainframe	3.46	[illegible]	3.25	[illegible]	[illegible]	[illegible]		
Reliability of Peripherals	3.35	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Maintenance Service:								
Responsiveness	[illegible]	[illegible]	3.10	[illegible]	[illegible]	[illegible]		
Effectiveness	[illegible]	[illegible]	3.00	[illegible]	[illegible]	[illegible]		
Technical Support:								
Trouble-shooting	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Education	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Documentation	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Manufacturer's Software:								
Operating System	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Operation & Application	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Application Programs	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Ease of Programming	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Ease of Conversion	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Overall Satisfaction	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Did the system do what you expected it to do? (%)								
Yes	87.30	88.74	80.00	70.59	100.00	92.30	57.14	92.40
No	0.00	10.26	8.00	11.76	0.00	4.80	21.43	2.34
Haven't decided	12.30	0.00	12.00	17.65	0.00	2.40	21.43	5.26
Would you recommend system to another user? (%)								
Yes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
No	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
Haven't decided	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		

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Users Rate Their Mainframes . . .

Survey Item \ Manufacturer and Model	IBM 4341	IBM 3031 & 3032	IBM 3033	IBM 308X Series	IPL 4400 Series	Magnuson M80 Series	NAS AS/2, AS/6, AS/8	NAS AS/7000 AS/9000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Plans for system replacement in 1983 (%)								
Yes, Same Manufacturer	13.32	27.87	14.29	3.77	0.00	0.00	15.79	7.69
Yes, Vendor Unknown	1.04	3.28	0.84	0.00	0.00	0.00	21.05	0.00
Yes, Different vendor	1.04	0.00	0.00	0.00	0.00	5.26	5.26	0.00
No	84.60	68.85	84.87	96.23	100.00	94.74	57.89	92.31
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Significant Problems (%)								
Computer proposed by vendor was too small	4.40	3.28	0.82	0.93	0.00	0.00	0.00	7.69
Installation of equipment was late	3.11	3.28	5.74	0.93	0.00	5.26	5.26	0.00
Delivery of required software was late	5.98	3.28	4.10	0.00	0.00	0.00	10.53	0.00
System costs (for hardware, vendor-supplied software, support) exceeded the expected total	10.88	8.20	10.66	3.74	8.33	0.00	10.53	0.00
Vendor did not provide all the promised software or support	10.88	6.56	4.92	2.80	8.33	16.79	5.26	15.38
Program/data compatibility not what vendor promised	1.81	0.00	1.64	1.87	0.00	0.00	0.00	0.00
Terminals/peripherals compatibility not what vendor promised	1.81	0.00	3.28	0.93	0.00	0.00	0.00	0.00
Vendor enhancements/changes to hardware/software hard to keep up with	13.99	11.48	16.39	14.95	0.00	5.26	10.53	0.00
Equipment is excessively noisy	0.52	0.00	0.00	0.00	0.00	0.00	0.00	7.69
Power and/or cooling requirements are excessive	1.04	13.11	11.48	2.80	0.00	9.00	5.26	23.08
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Did the system do what you expected it to do? (%)								
Yes	94.03	86.06	94.21	93.46	100.00	94.74	100.00	100.00
No	2.08	3.28	1.65	0.93	0.00	5.26	0.00	0.00
Haven't decided	3.90	1.64	4.13	5.61	0.00	0.00	0.00	0.00

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Survey Item \ Manufacturer and Model	NCR 8400 & 8500	Sperry Univac 90/20 & 90/40	Sperry Univac 90/60 & 90/80	Sperry Univac System 80	Sperry Univac 1100/60	Sperry Univac 1100/80	Sperry Univac 1100 Series (Other Models)	Mainframes (Other Models)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Plans for system replacement in 1983 (%)								
Yes, Same Manufacturer	6.19	16.19	12.50	6.33	3.67	7.14	50.00	11.76
Yes, Vendor Unknown	2.06	4.55	0.00	0.00	0.00	7.14	0.00	17.65
Yes, Different vendor	3.09	8.08	0.00	4.17	0.00	0.00	0.00	14.71
No	88.66	69.18	87.50	87.50	96.43	85.71	50.00	56.86
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Significant Problems (%)								
Computer proposed by vendor was too small	8.25	31.11	12.50	41.67	21.43	14.29	16.67	17.65
Installation of equipment was late	10.31	11.11	0.00	33.33	7.14	7.14	0.00	14.71
Delivery of required software was late	15.46	17.78	25.00	20.83	10.71	0.00	0.00	8.82
System costs (for hardware, vendor-supplied software, support) exceeded the expected total	13.40	24.44	12.50	33.33	21.43	0.00	0.00	8.82
Vendor did not provide all the promised software or support	24.74	20.00	37.50	20.83	17.86	7.14	0.00	8.82
Program/data compatibility not what vendor promised	5.15	6.67	0.00	12.50	3.67	0.00	0.00	0.00
Terminals/peripherals compatibility not what vendor promised	3.09	2.22	0.00	8.33	0.00	0.00	16.67	0.00
Vendor enhancements/changes to hardware/software hard to keep up with	10.31	35.56	37.50	20.83	17.86	14.29	33.33	8.82
Equipment is excessively noisy	7.22	8.89	0.00	4.17	3.67	7.14	0.00	17.65
Power and/or cooling requirements are excessive	8.19	11.11	25.00	0.00	14.29	0.00	33.33	26.47
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Did the system do what you expected it to do? (%)								
Yes	87.63	80.00	75.00	70.83	78.57	64.62	100.00	61.18
No	5.15	17.78	25.00	12.50	7.14	0.00	0.00	2.94
Haven't decided	7.22	2.22	0.00	16.67	14.29	18.38	0.00	8.88
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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. . . And the Vendors of Those Mainframes

Survey Item \ Manufacturer and Model	Amdahl	Burroughs	Control Data	Digital Equipment	Honeywell	IBM
No. of User Responses	46	89	6	86	91	[illegible]
No. of Systems Represented	86	159	6	98	160	[illegible]
Avg. Life of System (Mos.)	39.5	49.69	45.7	38.3	57.4	[illegible]
Plans for system replacement in 1983 (%)						
Yes, Same Manufacturer	18 22	11.24	0.00	5.26	7.50	17.26
Yes, Vendor Unknown	17 38	4 49	0.00	0.00	6.25	2.33
Yes, Different vendor	3 17	2 25	0.00	2.63	12.50	0.61
No	65 22	82 02	100.00	92.11	73.75	78.58
Significant Advantages (%)						
Users are happy with response time	71 74	43.39	33.30	68.50	54.32	60.81
System is easy to expand/reconfigure	43.48	70.33	66.67	71.05	65.79	40.58
System costs were less than expected	22.61	7.78	0.00	10.53	6.17	13.38
Programs/data ported over from other systems are compatible, as vendor promised	73.91	69.66	66.67	31.58	33.16	46.22
Terminals/peripherals ported over from other systems are compatible, as vendor promised	69.57	44.44	16.67	34.21	13.58	52.74
System is power/energy efficient	41.30	33.33	16.67	16.79	16.05	41.58
Productivity aids help to keep programming costs down	30.39	38.38	0.00	46.74	34.03	36.15
Data base language is efficient and effective	30.81	33.33	0.00	31.58	30.40	19.64
Delivery and/or installation of equipment was ahead of schedule	26.08	16.38	0.00	16.79	9.04	17.26
Delivery of required software was ahead of schedule	17.39	16.67	0.00	6.26	4.94	[illegible]
Significant Problems (%)						
Computer proposed by vendor was too small	4 28	8 89	0.00	13.16	14.81	4 61
Installation of equipment was late	2 17	31.11	0.00	7.89	14.81	3 61
Delivery of required software was late	2.17	12.22	0.00	15.79	14.81	4 61
System costs (for hardware, vendor-supplied software, support) exceeded the expected total	6 52	13.33	0.00	7.89	22.22	9 63
Vendor did not provide all the promised software or support	4.35	17.78	0.00	10.53	25 93	7 92
Program/data compatibil not what vendor promised	0 00	4.44	0.00	2.63	4 94	3.00
Terminals/peripherals compatibility not what vendor promised	2 17	1.11	0.00	0.00	3.70	1.90
Vendor enhancements/changes to hardware/software hard to keep up with	4 28	20 00	16.67	7.89	13.58	14 62
Equipment is excessively noisy	4 28	6.67	16.67	18.42	11.11	0 90
Power and/or cooling requirements are excessive	8 70	13.33	50.00	15.79	11.11	6 42
System Ratings (4.0-1.0)						
Ease of Operation	3.32	3.09	3.00	3.75	3.14	3.10
Reliability of Mainframe	3.57	3.36	3.33	3.42	3.36	3.67
Reliability of Peripherals	3.19	3.09	3.00	3.84	3.00	3.20
Maintenance Service:						
Responsiveness	3.41	3.09	3.25	3.11	3.17	3.34
Effectiveness	3.41	3.70	3.00	3.00	3.04	3.30
Technical Support:						
Trouble-shooting	3.40	2.93	3.00	3.00	3.04	3.00
Education	3.00	3.24	3.67	3.00	3.44	2.77
Documentation	2.98	3.00	3.00	3.00	3.04	2.70
Manufacturer's Software:						
Operating System	3.11	3.05	3.00	3.42	3.34	3.11
Compilers & Assemblers	3.16	3.17	3.17	3.13	3.17	3.33
Application Programs	3.07	3.02	3.20	2.76	3.00	2.84
Ease of Programming	3.30	3.30	3.17	3.00	3.00	3.06
Ease of Conversion	3.09	3.07	3.00	3.00	3.01	2.97
Owner Satisfaction	3.34	3.00	3.00	3.32	3.01	[illegible]
Did the system do what you expected it to do? (%)						
Yes	87 66	83.33	83.33	89.47	82.72	93 16
No	0 00	8.89	0.00	2.63	9.88	2.62
Haven't decided	3.22	7.78	16.67	7.89	7.41	4.23
Would you recommend system to another user? (%)						
Yes	96.56	78.89	66.67	77.76	82.50	90.51
No	2.23	7.78	16.50	5.04	10.76	5.04
Haven't decided	1.22	13.67	0.00	16.67	10.76	6.66

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Survey Item \ Manufacturer and Model	IPL	Magnuson	NAS	NCR	Sperry Univac	Other Mainframes
No. of User Responses	12	19	22	97	128	36
No. of Systems Represented	13	23	28	107	152	40
Avg. Life of System (Mos.)	22.6	28.1	50.2	42.2	46.4	72.1
Plans for system replacement in 1983 (%)						
Yes, Same Manufacturer	0 00	0 00	12 90	6 19	13 90	11.76
Yes, Vendor Unknown	0.00	0.00	12 90	2 06	3 42	17 65
Yes, Different vendor	0 00	6.26	3 13	3 09	4 03	14 71
No	100.00	94.74	71.86	88 66	90 65	56 86
Significant Advantages (%)						
Users are happy with response time	84.67	63.16	63.13	67.72	53.86	32.35
System is easy to expand/reconfigure	84.26	68.47	43.76	73.20	56.86	50.34
System costs were less than expected	23.29	36.84	38.16	16.49	11.20	26.47
Programs/data ported over from other systems are compatible, as vendor promised	79.00	84.76	79.09	61.86	46.06	50.00
Terminals/peripherals ported over from other systems are compatible, as vendor promised	66.26	68.42	66.76	46.37	39.80	30.41
System is power/energy efficient	63.26	72.63	46.08	14.43	39.80	17.65
Productivity aids help to keep programming costs down	39.80	21.00	2.13	20.60	67.00	17.65
Data base language is efficient and effective	6.00	21.00	13.50	6.19	30.80	11.76
Delivery and/or installation of equipment was ahead of schedule	66.80	68.42	87.00	2.30	20.00	6.00
Delivery of required software was ahead of schedule	16.67	21.00	16.76	5.16	13.00	3.00
Significant Problems (%)						
Computer proposed by vendor was too small	0 00	0 00	2 13	8 25	37 20	17.65
Installation of equipment was late	0 00	5 26	2 13	10.31	12 90	14.71
Delivery of required software was late	0 00	0 00	6 26	18.46	14.40	8.82
System costs (for hardware, vendor-supplied software support) exceeded the expected total	8 33	0.00	8 26	13.40	20 90	8.82
Vendor did not provide all the promised software or support	8 33	18 79	8.38	24 74	18.40	8.82
Program/data compatibil not what vendor promised	0.00	0.00	0 00	6 18	6.90	0.00
Terminals/peripherals compatibility not what vendor promised	0 00	0.00	0.00	2 06	3 20	0.00
Vendor enhancements/changes to hardware/software hard to keep up with	0.00	6 26	6.25	10.31	26.40	8.82
Equipment is excessively noisy	0 00	0 00	3 13	7 22	6 90	17.65
Power and/or cooling requirements are excessive	0 00	0.00	12.90	6 18	10.40	26.47
System Ratings (4.0-1.0)						
Ease of Operation	3.75	3.89	3.19	3.40	3.21	3.19
Reliability of Mainframe	3.73	3.86	3.47	3.47	3.48	3.19
Reliability of Peripherals	3.38	3.31	2.95	3.10	2.88	2.79
Maintenance Service:						
Responsiveness	3.58	3.42	3.53	3.13	3.20	3.21
Effectiveness	3.58	3.38	3.38	3.05	2.83	3.00
Technical Support:						
Trouble-shooting	3.40	3.00	3.08	3.44	2.96	3.00
Education	3.00	3.00	3.00	3.00	3.20	2.34
Documentation	3.00	2.67	3.00	3.00	3.20	2.17
Manufacturer's Software:						
Operating System	3.00	3.45	3.01	3.10	3.20	3.01
Compilers & Assemblers	3.00	3.40	3.14	3.08	3.16	3.01
Application Programs	3.00	3.00	2.75	2.84	2.83	2.71
Ease of Programming	3.00	3.22	3.08	3.08	3.00	3.01
Ease of Conversion	3.00	3.67	3.10	3.16	3.70	3.00
Owner Satisfaction	3.11	3.38	3.10	3.08	3.00	3.00
Did the system do what you expected it to do? (%)						
Yes	100 00	94.74	100.00	67 63	78.03	91.18
No	0.00	5.26	0 00	8 16	12 10	3 94
Haven't decided	0.00	0 00	0.00	7.22	6 97	6.88
Would you recommend system to another user? (%)						
Yes	100.00	89.47	90.86	76.29	67.74	48.00
No	0.00	10.53	0.46	10.31	16.13	45.76
Haven't decided	0.00	0.00	10.00	10.31	16.13	6.24

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EDITORIAL

Keep a Tighter Rein

DP managers are learning that it is better to be safe than sorry when it comes to deterring computer crime, as three stories in last week's issue of *Computerworld* demonstrated.

In Illinois recently, officials at Southern Illinois University unraveled a trail of computer fraud stretching back five years, 2½ years after the alleged ringleader had resigned his post as director of computing affairs at the university. According to court papers, the school estimates that at least five other DP employees were involved in the scam.

Halfway across the country, in Olympia, Wash., a programmer/analyst managed to steal $17,000 over 10 months via a government systems installation. The theft was discovered accidentally during a routine audit. Ironically, the self-confessed thief's job responsibilities included designing safeguards to prevent unauthorized access to the state's system.

In New York, a speaker at a seminar on computer crime exhorted his listeners to take note of unusual changes in an employee's life-style; it could be a sign of computer abuse, he warned.

For the DP manager, there are lessons to be learned from this sampling of computer-related crime that is by no means atypical. In the cases above, the culprits held upper level positions with responsibilities for systems security, financial issues or both and were able to use their positions to commit crimes over substantial periods of time without detection.

Also, in both instances, the thefts were discovered accidentally during routine audits.

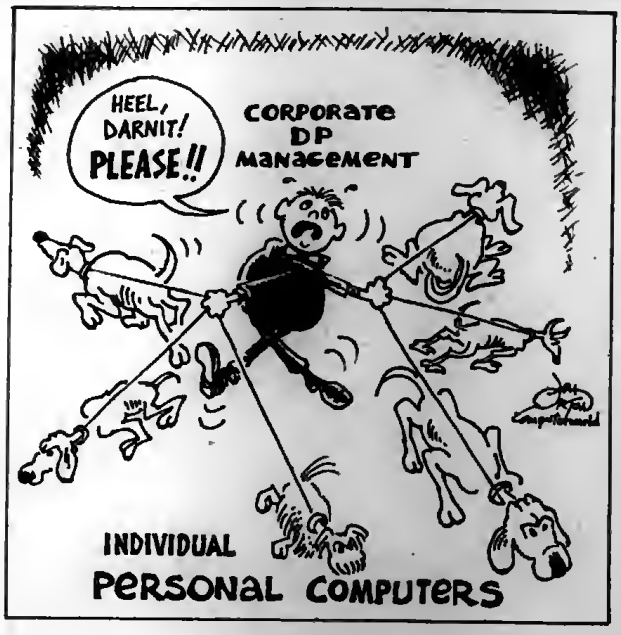
There are several steps that can be taken to combat the ease with which most computer crime seems to take place. DP managers need to keep a tighter rein in two areas — personnel and systems security. As suggested in the New York seminar, managers should take the time to check their security controls. Too often, DP and company officials assume such controls are in place when, in fact, they either are not or are easily circumvented. Also, the number of people with access to those codes should be limited and note should be taken of those with access.

Personnel is another area that merits close watch. By virtue of their scope of responsibilities, senior-level personnel warrant close scrutiny. Also, there is no reason why departmental audits should not be conducted immediately after a change of the guard.

And although some states and university regulations do not require it, substantial contracts for computer equipment should be competitively bid.

Obviously, despite all efforts, computer crime can happen. Secretly firing wrongdoers with a slap on the wrist hardly sets a good example. Since efforts to bring computer criminals to justice have in some cases been stymied by antiquated laws, DP managers have a responsibility to help lobby for stronger laws. One such bill is under consideration in Massachusetts.

Prompted by a 1981 Supreme Court ruling stating that a person who steals a magnetic tape could be prosecuted only for the value of the tape itself, the Massachusetts bill would classify electronic impulses as property, making it much easier to prosecute offenders for the value of the information that is recorded electronically. It is hoped that in turn, companies will take a more aggressive tact with suspected computer criminals.



LETTERS

Leave Keyboard Unlocked

I agree with Dick Smith's In Depth article "Faster Is Better" [CW, April 18] regarding the value of subsecond response time.

In particular, the comments regarding users who may wish to enter two or three transactions without interruption struck a rather sore nerve with me.

IBM has always emphasized a half-duplex communications protocol and a transaction-response terminal mode of operation in which the keyboard remains locked against further input until a transaction is completed.

There is nothing in this world more frustrating than a locked keyboard that breaks a train of thought. Smith's proposed solution is traditional, faster and bigger hardware. Why not simply leave the keyboard unlocked at all times and queue any user input that cannot be serviced immediately.

Minicomputers and microcomputers have operated with unlocked keyboards for years, utilizing full-duplex (really echo-plex) communications protocols.

IBM's VM/CMS tries to keep 3270 keyboards unlocked whenever possible, and VM is usually considered to be faster than TSO. Perhaps it is VM's unlocked keyboard as opposed to TSO's locked keyboard that is largely responsible for the perception that VM/CMS is faster than TSO.

R.G. Bryan
Systems Support Analyst
Newport News Shipbuilding
Newport News, Va.

Where's the Shortage?

As an entry-level programmer, I must voice my extreme displeasure with the continued harping over an alleged programmer shortage and terrible applications backlogs, as illustrated in the article "Micros Seen Holding Key to DPer Lack" [CW, April 25].

Of course it is the right of an employer to seek whatever type of employee he wants. But in no other sector of the work force besides data processing have I observed a profession so reluctant to add new talant to its ranks.

Is it planned that data processing will totally collapse when the last experienced programmer retires?

The want ads for the past year that I have seen have read: "Must have two years' experience." If this practice continues, in 1993 they may as well read "Must have 12 years' experience."

I am familiar with sil of the arguments on the subject, but the game of stealing each other's people is absurd.

Do managers plan on paying experienced programmers $100,000 salaries in 1993? I, for one, would start at minimum wage and let my boss judge my worth from there.

There is a legion of us out here from which to choose, so please don't bore us with your crying about shortages. If you cannot find an experienced programmer, make one.

It's hard to believe that an occupation suffering from s so-called severe shortage of talent would not hire entry-level people.

Darell L. Case
Tempe, Ariz.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

LECHT ON SCIENCE / Charles P. Lecht

DP Lawyers: Hessians of U.S. Tech Revolution

This is the first of a two-part series on DP lawyers.

The current, apparently endless, spectacle of a computer/communications industry being rent by litigious frenzy is as depressing as it is unappetizing to all who witness or are otherwise caught up in it. The unmistakable smell of chicanery wafting up from it cries out for a remedy. At the very least, we should be suspicious of lawyers who seem comfortable plying their trade in the upper reaches of high technology when they are equipped neither by training nor experience to deal with the substantive issues they must find there.

The extent to which exactly such pushcart purveyors of law (as opposed to those appropriately outfitted with information and principle) clog and clamor in the streets of our scientific neighborhood genuinely alarms me: We need to take action before it becomes a slum.

I think that lawyers who represent themselves as capable of practicing in science should be subject to qualifying tests to establish that they meet certain standards for doing so. That is what our legal system and its main advocate, the American Bar Association (ABA), does to scientists who wish to be lawyers.

That lawyers hold their discipline to be out-of-bounds to scientists, raising the specter even of jail for those of us who encroach upon their domain without what are deemed to be proper credentials, should serve as motivation enough for us to prevent lawyers who would fraudulently practice science from corrupting our domain with their presumption.

But rest assured, the faintest hint that a nonlawyer may be venturing an opinion on the law as it pertains to science is guaranteed to elicit a passionate rebuke from some lawyer waving his ABA surgical bludgeon and crying, "What does he know about law?" Arrange a visit for the selfsame lawyer to an electronic laboratory, however, and he may well prove incapable of flipping the cloakroom light switch without technical assistance.

It is a tasteless joke to suggest that lawyers are informed in the exercise of their practice by anything resembling the dedication to the well-being of others expressed for physicians by the Hippocratic Oath. On the contrary, corruption is probably more efficiently ferreted out by people whose firsthand knowledge of it equips them to recognize its hiding places. From individual practioners to Charles Addams husband-and-wife teams to firms whose prestige resounds in a suspect firmament, fakery in handling data processing litigation is, unhappily, the norm.

At Sixes and Sevens

When the purchaser of a computer and/or communications system starts to run into usage difficulties, it is almost inevitable that both he and the system's manufacturer will find themselves at sixes and sevens (0s and 1s?). And if these difficulties persist, their relationship is bound to become even more strained, heating up with the passage of time.

Finally, at a critical moment, the dew point of data processing frustration is reached and in this saturated atmosphere, a noxious fog of lawyers forms, distributing itself evenly over the landscape, never more to disperse until the unfortunate human beings-turned-litigants are thoroughly leached of their money, their patience or, worse, their lives. For once on the scene, these succubi are quick to demonstrate what an unusually hardy strain they are, rather like tropical protozoa whose growth can only succeed in the rich agar-agar of the lawsuit.

That they can fulfill little more than a kind of Robert's Rules of Order referee function is surely unworthy of us in the industry, who are almost invariably as bright or brighter. To me, this conjures up an image of the scientist/industrialist as belonging to a race of highly evolved superbrains to be herded, corralled and fattened for the kill by lesser, but wilier and more aggressive, creatures.

Question of Degree

Don't get me wrong: I am not claiming either that all scientists are superbrains or that all lawyers are baboons. Nor do I think that unscrupulous behavior is the monopoly of any one professional group, since there is ample, if circumstantial, evidence to suggest it is pretty equally distributed among all groups. Thus, as always, it is a question of degree that becomes important in assessing the influence of otherwise routine incompetence and arrogance at any given moment in business. Behavior of this sort tends to skitter, with all the sensitivity (but none of the beauty) of quicksilver. No class or group of people can prevent it from forming a puddle that occasionally seems deeper in one spot than in another.

My involvement with DP-related litigation over the course of almost 30 years in the computer industry has found me cast in the role of plaintiff, defendant and expert witness. And while behind-the-scenes settlement negotiations in the last category have accounted for the overwhelming part of these affairs, some have also reached the courts.

Now it could be that the ineffable pleasure of working with nincompoops whose technological grasp of their cases has ranged from inaccurate to nil has been mine alone. Maybe I am the only soul to have noticed that legal eagles like these exist and cost their clients and companies untold misery (and money). But I don't think so.

Other (and recent) legal horror stories that reach my ears confirm the validity of my perception and experience. That a recently advertised call for support in bringing suit against a certain computer manufacturer elicited 400 replies speaks more directly to the ambulance-chasing mentality of the respondents' legal staffs than to anything else. Could the manufacturer in question have been so powerful a hypnotist that 400 sophisticated businessmen (at least) bought his pitch before someone finally blew the whistle? Baloney! Talk about lawyers gone wild in

(Continued on Page 86)

HUMAN CONNECTION / Jack Stone

We Want Value, Not Gimmicks, in Systems

Hear ye, hear ye! Let the trumpeters blare and let the drummers roll, for the executive scheduler has arrived!

In case you aren't already familiar with this software, let me advise you that various forms of it under different names are being touted by several vendors as the solution to the supposedly critical need for an automated calendar to aid peripatetic executives during their peregrinations.

I had my first encounter with one version of such a scheduler several weeks ago. It was on a minicomputer system I was using as part of a hands-on literacy class. After seeing it in operation, I have to say that I would not want to be the person to prepare a cost/benefit justification for its use, because it would be tough to do.

On the other hand, the next time you're feeling blue, find a terminal that supports the application and fool around with it for awhile. It will lift your spirits; it is the penultimate Donkey Kong of the business systems world.

Here's how it operates. Assume you are an executive who is really going to do something tomorrow, and I mean something really important. You are going to have to sit right down and figure out if you are going to engage in a task, set up a meeting or just do something.

If you decide to engage in a task, the machine prompts for its name, time slot and optional additional detail and stores the data. If you go the whole hog and choose to set up a meeting, the machine — through the miracle of modern-day computer automation — will scan the calendars of each person you want to invite to the affair, plus those of desired meeting rooms, and figure out common times of availability.

Some Fun

To have some fun, merely touch a few keys, and events for any day pop up on the display. Or if you need a broader perspective, a different sequence will show your weekly calendar or, alternatively, the monthly summary.

Let's simulate the situation in which you see the monthly spread and are interested in what is happening on a specific day.

You push a couple of buttons and whammo — the weekly spread is selected. A few more taps and pow — the daily detail shows up.

After demonstrating this electronic gem to the class I was giving, one of the attendees must have sensed something awry because he asked the question "Is this software really practical for executives?"

Depends on Needs

My response to this is: I have to say, in fairness, that some firms will find it practical and others will not; it depends on their particular needs and what resources they are willing to commit to support such a system.

For example, it seems to me that each executive — or at least each executive secretary — who uses the system must have immediate access to a terminal for purposes of updating and retrieval.

Of course, a $5,000, 100-lb workstation is rather committed to one location, but one vendor with a scheduling capability recognized the need for portability and built the program into a programmable read-only memory and supported it with a $1,000 battery-operated, 4-lb-class intelligent terminal.

Then all participants must guarantee that they will update their schedules at least daily, maybe hourly, to make certain that the data is reasonably current.

The practical problem is that updating calendars is not necessarily the highest priority task of most executives, and I would guess that confidence in the quality of data would tend to falter if the updating fell behind. Also, what about executives who perpetually travel? Might not a $9.95 wallet-size calendar handle most of the necessary work?

My larger concern about the scheduling package is not so much with the software — which actually does a decent job — but with its implications.

If a DP manager attempts to justify an executive workstation on the basis of systems like scheduler and not on systems of substantially greater consequence to executives, DPers may be inadvertently leaving an impression of computer gimcrackery, which would be totally counterproductive to a plan for moving executives onto terminals.

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

THE DATA CENTER / John P. Murray‡

How Does Your MIS Group Handle Problems?

There ere several criteria that can be used to determine the effectiveness and the quality of a management information systems (MIS) department. Some of the more obvious things to check for come rather quickly to mind: service level, sound client relationships, an aggressive use of state-of-the-art techniques and adherence to budget, to name e few.

There is another measure — e more subtle but very effective measure — of a high-quality MIS function. This measurement has to do with the ability of the MIS department to overcome adversity in whatever form and to continue to produce the desired results.

This is not e commendation of the ebility of an MIS installation to survive on e continuing basis in a crisis environment. That ability is not a reflection of e high-quality, well-run MIS department; it may be a tribute to the hard work of many dedicated people.

But it is also e reflection of poor MIS management. The issue here is with the ability of the MIS department to react to and to overcome those occasional or unusual problem situations that are brought about either throogh MIS errors or from sources outside the MIS department.

It is impossible to eliminate all difficult situations in an MIS function. We are involved in too many high-risk ventures and are simply much too vulnerable to forces beyond our immediate control to attempt to build error-free environments. The goal, then, should not be to eliminate all difficulties, but to manage effectively difficult situations when they arise.

There is no need to go through a litany of the causes of the problems we fece; we are all familiar with them. What is of concern here, relative to being able to measure the effectiveness of the MIS function, is how the problems, once identified, are handled. Do new problems simply increase the crisis level in the MIS department, or are they handled in a professional manner?

In poorly managed installations, the usual first step once a problem has surfaced is to engage in a finger-pointing session with everyone involved rather than to move to the problem at hand and solve that problem. In these situations, a great deal of time, effort and energy is needlessly expended upon what at that particular time is the wrong issue. Under these circumstances, the focus is on the cause of the problem; it ehould be on correcting the difficulty.

In e typical poorly managed MIS installation, the usual next step is to go through e series of false starts in the process of attacking the problem. Often, several people will go off in different directions, ettempting to attack the problem from several isolated positions, rather than to work together to define the problem and then continue to work as e team to implement an effective solution to that problem.

With the approach that is usually taken in a poorly managed MIS installation, more time is wasted, more effort needlessly expended end, as a result, unnecessary confusion is generated. What may have originally been e rather straightforward although urgent problem now escaletes to a crisis situation.

Well-Managed Installation

In a well-managed MIS installation, e different approach is taken to solve the problem. The question of who is et fault does not come up. Rather, the focus is on the particular problem, whetever it may be, and on its solution. The primary step is to identify the real cause of the difficulty, not to solve the symptom. This process is carried on in e spirit of teamwork and cooperation by everyone involved.

A plan of action is then developed thet identifies and prioritizes the problems and then assigns appropriate responsibility for the correction of each item on the plan of action. Some member of the MIS department is given responsibility for the overall coordination and control of the process, and ewift progress is made to attack the problems. This may mean that people have to work very hard and put in long hours.

A strong MIS function handles unusual situations with dispatch and professionalism. The members understand that difficult situations that call for extra effort will arise, and when they do, everyone who can help swings into action to solve the problem. When this occurs, e high degree of MIS effectiveness is achieved. The members of such an MIS department should feel good ebout the job they are doing.

Murray is director of MIS for Ray-O-Vac Corp. in Madison, Wis. He is responsible for worldwide MIS activities. Murray has 21 years of DP experience, 10 of which have been devoted to the management of data centers.

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READER COMMENTARY

Case of the Daytime Moonlighters: A Reason

With computer crime laws in effect in 18 states now, the data processing professional might well wonder how these new laws will affect the conditions under which he will work.

Consider the case of Frank Lewis and Cathy Benedict, two entrepreneurial programmers whose moonlighting in the daylight got them in trouble with the law.

They had formed a company called Arid Computer Systems, which provided computer services to Certified Food, a Los Angeles food wholesaler. In 1981, Lewis went to work for CHB Foods, Inc., a competitor of Certified Food's, to update CHB's wholesale pricing programs. Once employed, Lewis did considerable work for Certified Food. His contract began at $1,000 per month regardless of the volume of work performed and could go to $2,600 per month in additional labor charges. Later, he brought Benedict to work for CHB as operations manager.

Key Issue

As is often the case in criminal law, a key issue in the case against Lewis and Benedict is intent: Did they intend to use the CHB computer for fraud or misrepresentation? If not, prosecution under the California computer crime law will be difficult. The question of intent invites a rare look into what happens at a data processing center, as the following questions demonstrate:

- How thoroughly are employees checked before they are hired?

Depending on which of the court documents you believe, Lewis was well (or poorly) checked out before he was hired. Lewis' papers point to court testimony that a supervisor had discussed his prior work for Certified Food with a representative of that company. Los Angeles prosecutor Clifton Garrott was quoted in *Computerworld* as claiming that CHB "apparently knew nothing of Lewis' and Benedict's outside business dealings when the pair was first hired" [CW, July 26].

However, there is no evidence that anyone ever flatout asked Lewis whether he would be doing any programming on company machines that might interfere with his duties. Nor is there any evidence of Lewis volunteering information about possible conflicts of interest.

- How well are policies on employee time use communicated and enforced?

Defendants Lewis and Benedict claim that their open use of the CHB computers proves that they had no intent to commit computer crime.

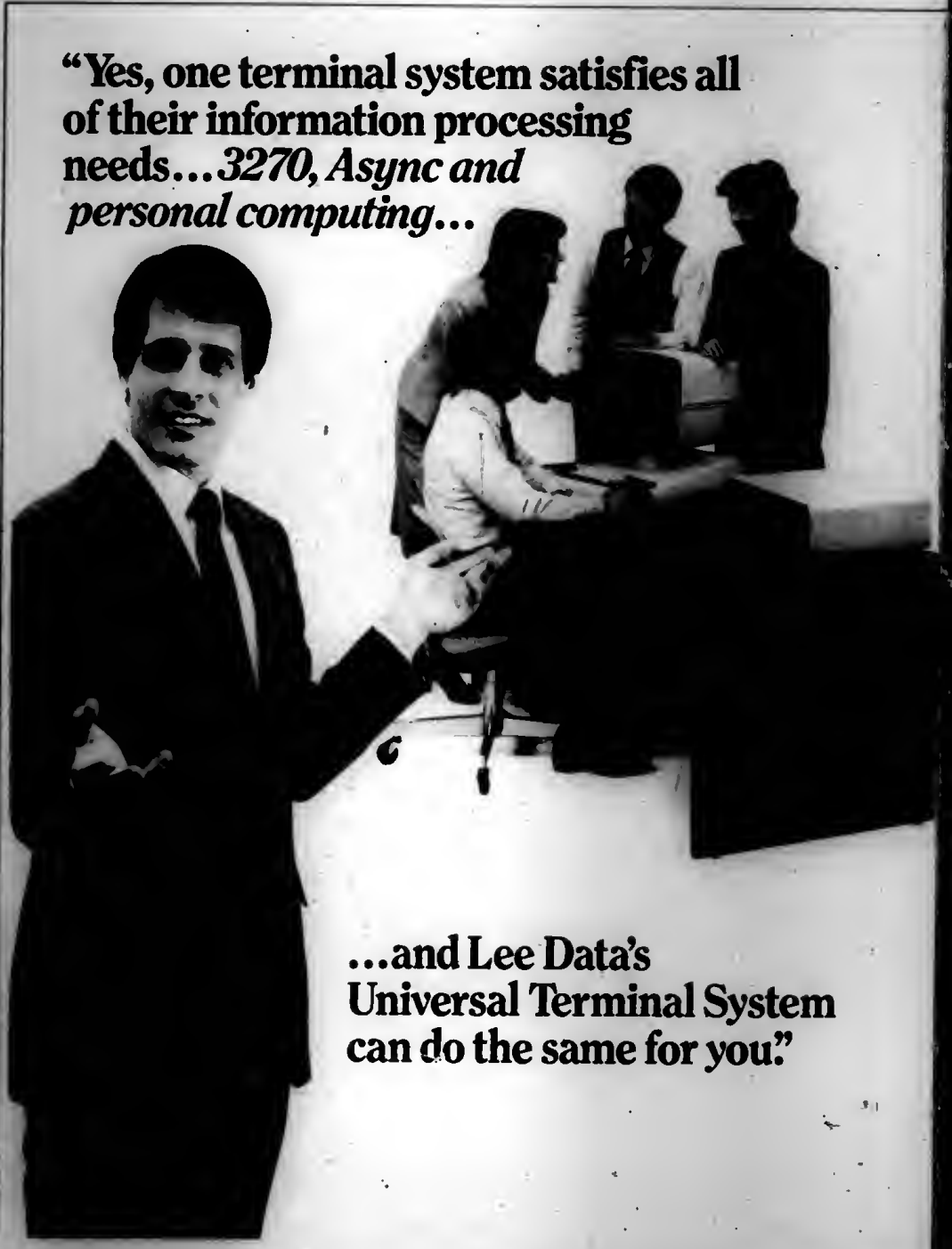
Lewis and Benedict's papers urged that they were open about the work they were doing for Certified Food. They point to testimony that a separate file designation was used on all files processed for Certified Food and that this designation was known to members of the staff at CHB.

The prosecution challenges this characterization, focusing on testimony that employees were not allowed access to the computer center when Certified Food programs were being run.

There is also testimony that employees of CHB had to do more work, some of it compensated with overtime pay, just to take care of the excess that resulted from Lewis' and Benedict's efforts.

- How do you value your time?

Can a value be put on computer time? The answer to that question may determine whether Lewis and Benedict are guilty of theft. Lewis and Benedict are charged with theft, attempted theft and computer crime. In a pretrial motion, they urged dismissal of their case based on inadequacy of the



Jay BloomBecker

for Making Preemployment Agreements

showing of evidence at the preliminary hearing in their case held last August.

California law requires a showing that stolen property is valued at more than $400 for felony theft charges to stick. In this case, the programmers claim that the prosecutors have not proven that the time they used had that much value.

Both sides seem to accept as fact that Lewis and Benedict used the CHB computer for 158 hours on Certified Food jobs. Putting a value on the computer time is a lot harder. CHB leased its computers on a monthly, flat-fee basis, paying no more if the computer was used 24 hours a day than if not at all. There was slack time anyway, the defendants argue.

Questionable Reply

In a questionable reply, the prosecution argues that the payment of $1,000 a month to Arid Computer is evidence of the value of the computer services. But that would be true only if the $1,000 figure contained no compensation for Lewis' and Benedict's own contributions to the effort. The prosecution avoids the hard question: What if the defendants argue that they are getting paid all of the $1,000 a month for their expertise, and the amount paid for use of the computer is minimal? How does the prosecution prove them wrong?

If you were to receive a call from Los Angeles' top computer crime prosecutor asking how you would establish the value of your computer time in a situation like this, what would you reply?

An alternative prosecution theory, of interest to all employees I am sure, is that premeditated daytime moonlighting is theft of salary. Los Angeles prosecutor Garrott contended in court papers that there is an implicit promise to work only in the employer's interest when one assumes a job.

Not too surprisingly, the defendants disagree; they contend that they were told just to get the work done and they did.

Who's Right?

Who is right? Have Lewis and Benedict broken a promise? In retrospect, the lesson is clear: The promise should have been explicit. A written promise carries much more weight than an implicit one.

The more we value our computer operations, the more we have got to value personnel who contribute to those operations. The programmer, the data manager, the analyst and the operator are all assets necessary to the data processing operation. Protect their work with whatever communication style your management policy dictates, but do not ignore their worth.

Remember that problems like the one CHB wound up with in this case could not occur quite so easily if adequate preemployment agreements defined each side's understanding of rights and responsibilities.

BloomBecker is an attorney specializing in computer crime law, director of the National Center for Computer Crime Data in Los Angeles and editor of the monthly Computer Crime Digest.

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LETTERS

Not a One-Time Fix

In the editorial "Promises, Promises" [CW, April 18], *Computerworld* looks at the information center as a technique to reduce the application backlog and as one of the tools to "improve the efficiency of the MIS [management information systems] organization." In view of the significance of the application backlog to the typical data processing manager, your other comments in the editorial are understandable.

Consider that for many installations, the information center has enabled faster implementation of applications, unearthed invisible backlog, increased demand for overall computing resources and placed new demands on the traditional MIS people in support of information center activities.

It is a misdirected comment, however, to say that the information center has not improved the efficiency of MIS because the total resource demands are higher. If we look at the situation from a different perspective, we see that end users are handling many technically trivial, ad hoc query and report requests themselves; highly skilled applications programmers are spending more time using those skills on complex applicationa built; and some end users are taking on the major design phase of new applications, providing some fairly extensive prototypes, as *Computerworld* points out.

Thus, demand may be greater and the backlog may be longer, but the efficiency is quite probably higher than it's ever been.

The real thrust of the information center is corporate productivity, not MIS efficiency. As many articles in *Computerworld* of recent months have pointed out, companies and government agencies are finding the information center a vehicle to improve individual productivity, score significant cost savings and improve managerial decision making.

It is only natural that an additional effect is to highlight and increase further the appetite for still greater application of the computer to business problems.

These are the problems of success. Business professionals have seen a glimpse of what technology can do for them and they want more.

The promise of the information center truly "has not yet been realized," but for reasons different from what the editorial cites. The information center should not be a simple one-time fix for getting rid of annoying end-user requests or a way of turning business professionals into an auxiliary programming corps. Rather, it should be the productivity driver of the corporation, orchestrating and integrating the effective use of all aspects of data processing to the goals of the organization.

There are many disparate activities moving rapidly within businesses today — office automation, personal computers, mainframe programming and interactive computing, to name a few. The information center should be, and in some companies already is, the place for MIS to provide the rational guidance and technical leadership the corporation will be needing.

Raymond E. Youstra
IBM
Gaithersburg, Md.

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DP Lawyers And High Tech

(Continued from Page 81)

providing advice on when or where not to sue! Do you honestly think that there exist 400 lawyers in the whole world with qualifications to prosecute an essentially technical case?

I do not dispute the worthiness of establishing as a goal that any given lawyer should be capable of properly applying the law wherever it was called for to resolve disputes. But even the various bar associations have singled out our field as requiring some form of special attention, in view of the lacunae that punctuate the technical knowledgeability of their membership.

While the law books may offer case histories that reach back even to the dawn of time (which, of course, they don't), precedent quite naturally fails when it is called upon to deal with situations that are, in effect, without precedent, such as the synthesis of heretofore discreet domains of electronic technology that characterizes the products of our industry today. And it is precisely when little (if any) precedent is available that most lawyers falter in carrying out their charges, right or wrong as these may be. When location of an event has little bearing on geography, jursidictional domains are fluid and culpability arises from unscheduled man/machine interaction, litigation does little more than wear down the combatants, while providing, surely not through sheer coincidence, an endless (and endlessly profitable) stream of work for lawyers.

Unable to lead to the resolution of anything of technical consequence, their special requirements unmet by Tweedledee-vs.-Tweedledum applications of incorrectly selected or enunciated principles, cases become mired in a useless mythology of such (anti-) heroic proportions that litigants are inevitably drawn to seek extralegal means to find peace.

Lecht is president of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

GETTING AHEAD IN DP / Donald J. Berardo

How to Defuse an Emotional Employee

The structure and environmental pressures of most corporations will not permit a free expression of emotions, particularly emotions that are highly charged with anger, tears and movement.

Unpredictable, emotional outbursts tend to disrupt the productivity and cohesiveness of the group and the individuals in it. Cooperation among DP project team members. can disappear whenever one or more people are having difficulty controlling their emotions.

The DP manager will certainly experience this problem and must be ready to defuse such an explosive situation with appropriate sensitivity and skill.

Key to Understanding

A key to understanding any emotional episode at work is to realize that all such situations have complicated origins, are important to the individual and should never be taken lightly. Strong, emotional feelings are always valid to the person experiencing them. The first rule then becomes: Give appropriate credence to the employee's right to have such emotions.

If these feelings are questioned, criticized or ignored, they only increase in intensity. Such reactions to emotional outbursts also damage the DP manager'a future ability to motivate auch an employee because of the loss of self-esteem due to his embarrassment in the presence of co-workers. An emotional employee needs to know that it is okay to be human and that DP management understands his predicament.

Next, it is very important to allow the employee to fully express such feelings in an appropriate, private setting. As soon as possible, offer to listen sincerely to this person in the seclusion of a private office. Try to take notice of the context of the episode and the people involved. This can be an important clue to what or who triggered the outburst.

There is no need to delve too deeply into the psychodynamics of such a problem. It is important to try to pinpoint how the work place, co-workers and management are involved in the problem. Often, auch feelings are related to a stressful home situation.

During the listening stage, show special care for the pain the person is expressing. Let the employee know that everybody has such feelings and problems at one time or another.

It is also useful to use touch and any other supportive measure that reinforces the process of complete expression and defusing. Although "hands-off" is usually the rule in business, physical contact can be soothing and reassuring in this sort of volatile situation.

After the employee leaves your office, take notes about the feelings expressed and keep this information confidentially stored. The DP manager must maintain this absolute confidentiality in order to build trust with such an employee and keep him from feeling stigmatized.

The ultimate resolution of such emotional outbursts may take several meetings to defuse completely and understand the origin of the episode. You may prefer to refer the employee to your company'a employee assistance program, but only with the consent of the employee.

Continue to reinforce that DP management cares and will help the employee to get through this difficult period without stigma or reprisal.

Patience, time and concern work wonders.

Berardo is a management counselor and career therapist. He is a vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

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READER COMMENTARY

Some Ways MIS Managers Can Approach the

In less than a decade, the personal computer industry has achieved greater annual sales and installations than the 20-year-old minicomputer industry.

In light of such an unexpected and unprecedented growth spurt, management information systems (MIS) managers must support and endorse this new technology or risk having their objections overridden in internal meetings. The seemingly low cost of personal computers, along with a wide availability, makes this technology a difficult management issue for MIS operations.

By the end of 1983, the billion-dollar baby of the computer industry — the personal computer — will show annual sales 30% higher than minicomputers: almost $7 billion vs. $5 billion. And if that doesn't indicate enough trouble for the granddaddy minicomputers, hardware costs have been declining for years and now represent less than 20% of the total cost of computer operations.

It is important to note that personal computers must be approached in an entirely different manner from the one used for the staid minicomputers. No longer does the customer wait for the man in the three-piece business suit to walk through the door, touting results shown in charts and brochures. Computer advice is widely available; it can be found in fully stocked computer stores and in shopping malls. Meanwhile, MIS managers, who used to be the first authorities on productivity improvements, are sitting alongside the Maytag repairman.

Tremendous Challenges

MIS managers face tremendous challenges because of these trends. MIS is charged with the responsibility to improve overall productivity throughout a company, while continuing to control departmental costs. But MIS managers do not have to bury themselves in desperation because several alternatives are available to help them continue to meet their responsibilities through personal computer technology.

The first major alternative is in-house computer education classes. While this may seem ridiculous to some, consider the fact that some computer stores claim that they can have a user operating a new personal computer after one morning of training. Unfortunately, this approach is misleading because the new owner is probably not proficient to any degree. But this characterizes the marketplace as it is today.

MIS should keep in mind that new users do not need computer science degrees to make productive use of a computer. In fact, all they need is a brief introduction to this new world and some practical guidelines on how to proceed.

The solution? MIS can develop in-house computer education or engage consultants to offer several hours of training for users. During this session, they learn basically what a computer is, what a personal computer can and cannot do, and they leave with detailed road maps of how to understand their business problems so they can intelligently make a purchase.

What many MIS managers do not admit is that users sometimes know their responsibilities and applications better than MIS. However, MIS can provide the computer literacy that users lack, just as they have in the past. Providing this education in-house avoids an inevitable conflict with users who appear to have computer savvy. Otherwise, MIS is trying to give advice users cannot relate to because of their lack of legitimate computer knowledge. At the same time, MIS is helping users do what they are going to do anyway — buy personal computers.

Contracting with an outside consultant for this training lets MIS continue to focus on major applications with sizable returns to the company. Using a third party for this training also reduces any embarrassment to users for all the questions they want and need to ask. Furthermore, a third party can more easily tell users to do their homework and show them how to do it.

The next major alternative to consider is experimentation through the use of a young MIS employee. The personal computer is not a passing fad, so it is pointless to try to stop the erosion of existing smaller applications. Why not try to build an application that has broad company appeal?

Ask a young MIS employee to choose a personal computer, a potentially popular new application and a tight schedule to wrap up projects. Then direct him to complete the assignment by programming the application and demonstrating the results to a user to assure its completeness. Young people historically are more creative than diehards entrenched in company policies. Today, many

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A simple matrix, virtually unlimited in size, lettered across the top of the screen and numbered vertically down the left side allows each user to design his own unique matrix size and write programs for any "what if" application. Once the worksheet has been designed, as many changes as desired can be made to the information by simply entering new values into the matrix. The computer instantly does all calculations and displays the results at every location affected. Some of the more significant features of OmniCalc are as follows:

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- Simple Implement

Growing Popularity of Personal Computers

young people are entering the marketplace with a degree in one hand and eight years of computer experience, gained in high school and college, in the other.

Perhaps the most significant alternative available is one already known in another form. IBM is credited with establishing the information service center. MIS provides a limited staff of business/computer consultants to help users automate for themselves.

One should carefully design the charter of this group, establish user response-time guidelines and review staffing assignments carefully. This approach provides the best balance for MIS control vs. productivity improvement throughout the company.

Word of Caution

But caution is called for because this concept can be abused. It can become a hardware purchasing center without ever evaluating need or value. Or the staff at the center may not provide consulting, but focus on building a list of contacts and applications. However, through standard management practices, these pitfalls can be controlled and overcome.

The information service center can be used to provide in-house computer education training. In addition, the software industry has refocused its product development dollars to the end-user market, which means that more user-oriented products are coming.

The center has tremendous resources available and many more tools are being pushed onto the electronic marketplace thanks to the revolution and evolution of hardware and software price/capability.

In staffing this center, it is important to remember that the audience for these services consists of people who do not need enormous data base technology or worldwide interactive applications. If this type of application is truly justified, someone at MIS can easily be assigned as project leader.

Perhaps it is obvious that this organizational approach provides terrific productivity for MIS. Users who buy personal computers with or without MIS support are now getting support, while quality-control standards and some degree of expense control are maintained.

During the last three years, it has been widely reported that the computer faces a tremendous shortage of qualified people. In addition, people costs are the most significant in a computer operation. Some prognosticators have even predicted that by 1985, people costs could represent 80% of total costs.

If users could become skilled practitioners for their own small computer operations, MIS could avoid the problem of a wide shortage of skilled people, while continuing to help improve overall productivity.

The information service center represents the best of all worlds if it is carefully and thoughtfully managed by MIS.

There is no longer a shortage of people in the computer industry, because everyone is a potential computer user in the near future. Higher technology computer skills are still very much needed and will come from MIS staffs and college graduating classes. Personal computers will force software technology to keep pace and bring us lower total computing costs. Don't let this billion-dollar baby, the personal computer, run over your career when there are many advantageous ways to use it.

Butler is a computer consultant at Charles L. Kern, a certified public accounting firm in Camp Hill, Pa.

If you're going to NCC to see the newest in computer terminals, 8-bit personal computers, 16-bit personal computers, mouse products, personal computer networks, integrated graphics, or application software, begin at the TeleVideo booth. Booth A3008, right at the Arena Entrance. We don't think you'll need to go any further.

READER COMMENTARY/Lance Batten

The Two Faces of Microcomputers

The current debate over decentralized personal computers vs. centralized computing services has become the subject of editorializing rather than the subject of a frank investigation of the advantages and disadvantages of each. Microcomputer vendors have the fervor of the newly saved. Battle-scarred DP managers find themselves cast in the role of antitechnologists as they try to avoid a chaotic introduction of micros.

While the disadvantages of micros are real, the benefits they bring are great enough that some companies can neither plan an orderly transition to decentralized computing services nor decide to stick to the traditional, centralized data processing department. This reminds me of the ass who starves to death between two bales of hay because it cannot decide which to eat. Such nondirection will prove to be the worst decision.

In particular, Gabriel Goldberg's letter to the editor [CW, April 11] about the article "Rejection of Micros Draws Astonishment" [CW, March 28] warrants a response. First and foremost, the people who are trying to beg, borrow or steal microcomputers for their departments are reacting to a very real need for decentralized computer services. Many of these needs remain unfilled due to the staggering costs of professional programming projects and the (apparently) inevitable overloading of central DP departments.

User needs go unmet due to the inability of the user to express them or owing to user frustration at having done so badly in the past. Often, the company's finest managers will simply decide to end-run the DP department and knock off their applications to their own satisfaction using the unsophisticated software that accompanies the micros rather than battle for a place in the DP schedule.

This is not really bad news. Most of the tasks that they want done are highly individual and best developed interactively by the person who needs to use them. If the task is general, there probably exists a packaged solution available at a price commensurate with the cost of the machine. In either case, the job gets done without endless meetings, proposals, evaluations and memorandums. For the smaller tasks to which micros are suited, flexibility and low management overhead are essential if they are to be cost-justified.

Drained by Demands

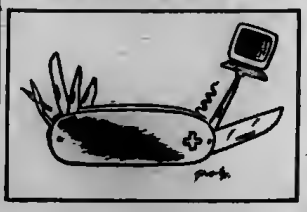
Unfortunately, a DP department can easily be drained by the demands for education, help, advice and equipment since each user who runs into trouble will inevitably turn there for help. Decisions made in isolation can easily result in a huge collection of incompatible equipment, software, data and floppy diskettes.

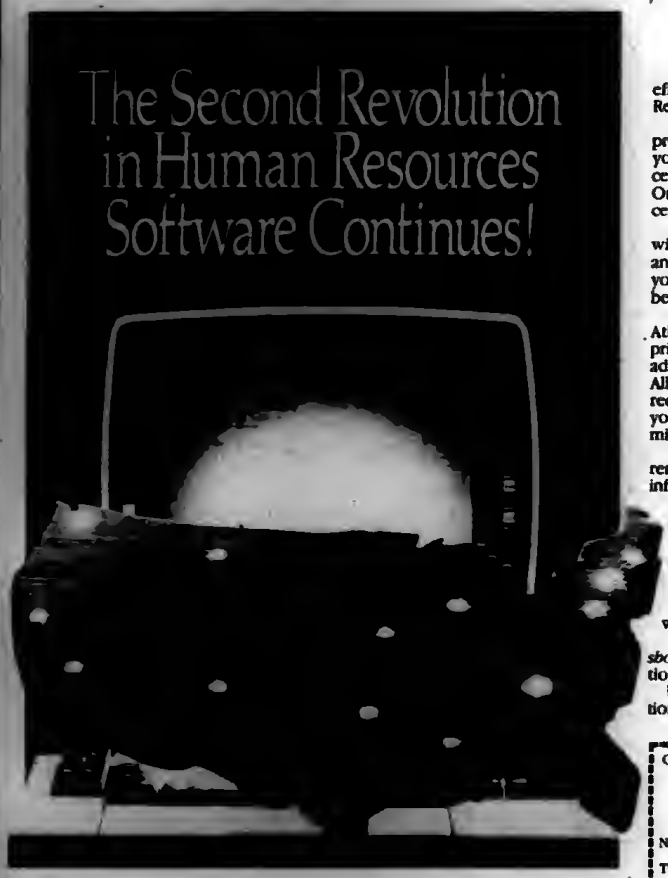
The innocent microcomputer budgeted with the calculators can end up swallowing enormous resources in personnel, peripherals, media and duplicated efforts. Management has discovered department salesmen doing mass mailings on copied diskettes. Managers have found themselves arguing violently over points that could be traced to outdated spreadsheet data. It's funny to tell the stories, but less pleasant to live them.

So why get involved in the mess? Are the heretics right in saying, "Thou shalt not purchase micros"? It is a little like trying to resist the introduction of the telephone on the grounds that telephone calls can be a terrible interruption. Those who have used the personal computer can (and will) tell of their triumphs. The strong demand for personal computing facilities is fueled by the simple fact that those who use them are succeeding and advancing because of them.

Among serious business users, the demand is not so much for personal computers as for personal computing. Most people prefer not to clutter their desks and their lives with cables, floppies and printers. They will pay the price for access to the personal, interactive software that runs on these machines. The best solution for them lies not in a blanket refusal to satisfy their demands, nor in allowing personal computer fans to hang themselves on their own inexperience. The DP manager who skillfully integrates microcomputers and minicomputers in a rationally planned system will be able to point to his achievements when budget time rolls around.

Batten is vice-president of Virtual Microsystems, Inc. in Berkeley, Calif.





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IBM Info Net Takes Middle Spot

Study Analyzes Remote Computing Costs

STAMFORD, Conn. — In a study comparing the costs of using remote computing services, the year-old IBM Information Network was revealed to be positioned in the middle of its competition — at least from in terms of CPU costs. In comparisons based on hardware groupings, Control Data Corp. (CDC) and Digital Equipment Corp. Decsystem-20 services shared equelly in low-cost honors for CPU costs.

These results were reported by Real Decisions Corp. (RDC) in its 1983 edition of "Time-Sharing Decisions," e report that compares the costs of using remote computing services on the basis of 23 benchmark runs designed to test I/O data handling capabilities and computational power. This year's report includes 40 services, eight more than last year.

The 23 benchmarks were coded in Fortran, Basic and Cobol and individually run on each of the time-sharing services. As a summary analysis, 33 of the 40 services were then divided into six major hardware groups — CDC, Decsystem-10, Decsystem-20, Honeywell, IBM CMS and IBM TSO — to compare the relative everage CPU costs of the benchmark runs. At least four services comprise each of these categories.

The IBM Information Network's Conversational Monitor System (CMS) service ranked fifth among nine CMS-based ser-

(Continued on Page 104)

VENDOR	REPORT REFERENCE	HARDWARE
ADP Network Services, Inc.	ADP	DEC-10
American Management Systems	AMS	DEC-20
Boeing Computer Services		
• Mainstream - CTS	BCS/CTS	IBM
• Mainstream - EKS	BCS/EKS	CDC
• Mainstream - TSO	BCS/TSO	IBM
Chase Econometrics/Interactive Data Corporation	CE/IDC	IBM
Citishare		
• DEC Service	Citi/DEC	DEC-20
• Honeywell Service	Citi/Honeywell	Honeywell
Computer Sciences Corporation		
• CSVS CMS Service	CSC/CMS	IBM
• CSVS TSO Service	CSC/TSO	IBM
• CSTA Univac Service	CSC/CSTS	Univac
Comshare, Inc.		
• CMS Service	Comshare/CMS	IBM
• CRC Service	Comshare/CRC	IBM
• XDS Service	Comshare/XDS	Xerox Sigma 9
Control Data Corporation	CDC/175	CDC
Control Data/Business Information Services	CD/BIS	IBM
Data Resources, Inc.	DRI	Burroughs
DTSS, Inc.	DTSS	Honeywell

Some Participants in "Time-Sharing Decisions — 1983"

MPG Offers Link for Ramis II, SAS Institute's Analysis Aids

PRINCETON, N.J. — Mathematica Products Group, Inc. (MPG) has announced an interface that operates between its Ramia II fourth-generation language and data base management system. and SAS Institute, Inc.'s statistical analysis software products.

SAS Interfece allows access to data from Ramis II, Software AG of North America's Adabas, IBM'a DL/1 and IMS, Cullinet Software, Inc.'a IDMS and Cincom Systems, Inc.'s Total data bases and from IBM Isam, Vsam end sequential files. Data is enhanced with Ramis II components end given to SAS for analysis, the vendor said.

Users can summarize, extend, sort, weigh or conduct character of numerical manipulations of any or all data items prior to statistical enalysis, a spokeswoman said. The interfece allows output to be routed to e terminal, printer or disk.

Features of the software interface include full prompting and on-line Help facilities. Procedures that can be accessed Include descriptive statistics, correlation and regression analysis, stepwise regression, fector and seasonal analysis, cross-tabulation and exponential smoothing projections.

The product runs under IBM's VM/CMS and MVS/TSO operating systems and costs from $1,000 to $2,000 from MPG, through P.O. Box 2392, Princeton, N.J. 08540.

CICS Version Out Of Freight System

ST. LOUIS — McDonnell Douglas Automation Co. (McAuto) has introduced an IBM CICS version of its freight rating and routing system said to perform the same functions as the IMS version, but executed under different software for companies using IBM's CICS facility.

McAuto Freight clients may process on McAuto computers or install the system on their own hardware (IBM 4300 series or larger). The new version uses IBM'a CICS communications with IMS.

The CICS version is base-priced at $150,000. An Extended Analysis Module priced at $90,000 is available in a CICS version from McAuto, through P.O. Box 516, St. Louis, Mo. 63166.

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'Genprep-1,' 'Genedit-1' Serve IBM OS, DOS

CHICAGO — Miroda Software Engineering has announced two products for use with IBM OS and DOS operating systems.

Genprep-1 is a general-purpose language preprocessor that provides character string and numeric variables, execution control statements, recursive macros and the ability to invoke user-written subroutines.

The package produces a tailored executable job stream from any number of job control files and macros in which Genprep-1 control statements and preprocessor variables have been incorporated, a spokesman said. The facility eliminates much of the manual intervention required to execute production job streams.

Genedit-1 is a general-purpose editor that utilizes facilities provided by Genprep-1 to control and modify editor command files. The editor provides the ability to insert selectively, delete and modify any number of lines in a target file, the vendor spokesman said.

Any preprocessor variable may be set with any portion of a line from the target file. The variable may then be used to control the execution of the editor command file, according to the vendor spokesman.

A permanent license costs $4,000 for both products with a 10% discount until July 1 from Miroda, which can be reached through P.O. Box 10089, Chicago, Ill. 60610.

IMF Tool Pinpoints Poor Response Cause

SUNNYVALE, Calif. — A real-time tool for analysis of work load degradation in IBM's IMS data base management system has been introduced by Boole & Babbage, Inc. Called IMS Management Facilities (IMF)/Workload Analyzer, the product provides information for pinpointing the cause of poor response time.

The package tracks individual transactions as they pass through the major events within IMS, a spokesman said. It views 283 states in which a transaction can exist. The Wait Display identifies critical resource bottlenecks, including phyaical and logical resources. The Detail Transaction Trace capability shows work load events in an on-line display.

A second component, called IMF/Resource Analyzer, investigates total system activity against the problem resource identified by the Workload Analyzer. The package runs under IMS Release 1.1.6 and above and is priced at $20,000 from 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

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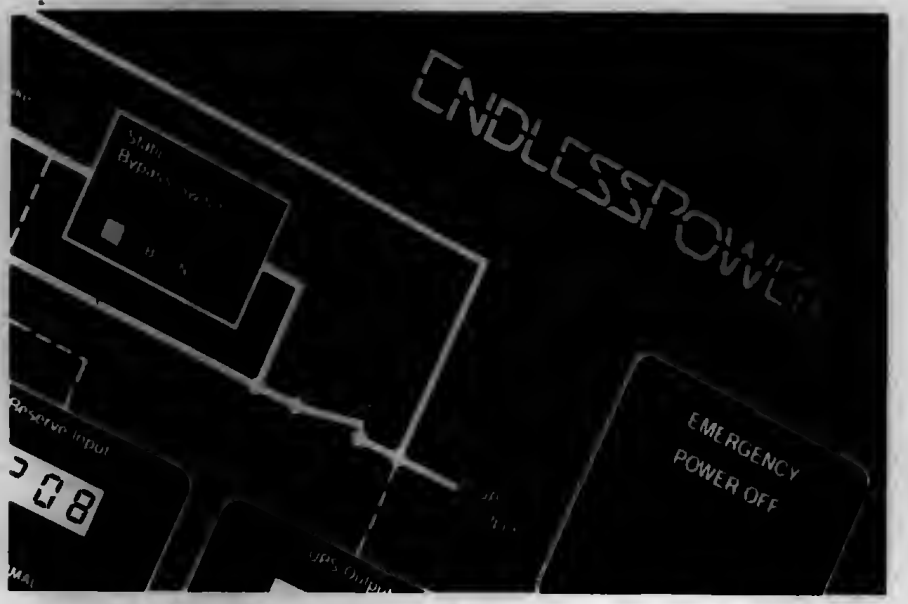

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Subroutines Aid DEC Programs

CHICAGO — Olamic Systems Corp. has announced Attain, a collection of subroutines that enables Cobol and Fortran programs to call data entry screens that have been created with the screen formatting functions of the company'a Demand 92 data base management aystem. The product runs on Digital Equipment Corp. Decsystem-10 and Decsystem-20 computers and Demand 92 screen formatting functions are included, a spokesman said.

The end-user-oriented, interactive screen design syatem allows the creation of multipage screens. A language called Logic 92 features string manipulation facilities and allows for field validation more easily than Cobol or Fortran, the spokesman claimed. A set of subroutines permits information displayed or entered on the screen to be accessible to programs.

The package reduces the time needed to generate data entry screens and reduces machine overhead, the spokesman said. It costs $9,900 from 141 W. Jackson Blvd., Chicago, Ill. 60604.

MCBA Offers 15 Packages

MONTROSE, Calif. — Mini-Computer Business Applications, Inc. (MCBA) has released 15 accounting, distribution and manufacturing packages written in Dibol for Digital Equipment Corp.'a VAX-11/730 and 11/750 auperminicomputers.

The packages are accounts payable, accounts receivable, base material requirements planning, bill of materials processor, customer order processing, fixed assets and depreciation, general ledger, inventory management, job costing, payroll, purchase order and receiving, report writer, ahop floor control, standard product costing and atandard product routines.

The packages use the Macro-Sort assembly language, and all support system spooling as well as disk file spooling. The customer order processing package utilizes IBM Isam files to speed order processing.

Fees range from $1,500 to $4,000 per package from MCBA at 2441 Honolulu Ave., Montrose, Calif. 91020.

MBI Tool Allows Shorthand Access To CICS Modules

PLYMOUTH, Minn. — MBI Systems, Inc. has announced Kwik, a product for IBM CICS systems that is said to allow communications with CICS modules in a shorthand method.

Kwik opens and closes files, controls terminal status and inquires on tasks. No modifications are required to the IBM software. The product is available in assembler code for IBM's DOS/VSE and MVS operating systems using Release 1.5 of CICS.

Kwik is offered for a one-time license fee of $45 for a limited time, a spokesman said from Suite 100, 3030 Harbor Lane, Plymouth, Minn. 55441.

Management System Fits VAX-11

GOLETA, Calif. — Signal Technology, Inc. has announced Smart-form, which it described as a Digital Equipment Corp. VAX-11 data management aystem that integrates the standard forms management system concept with a query language.

Functions like painting forms data entry structure, defining the VAX-11 RMS file structure and general query processing of records can be performed without writing program code, a spokesman said.

The "paint and process" capability consists of a forms design tool (FDT) and forms query language (FQL). FDT reportedly allows painting of the forms and supports capabilities like keypad editing similar to the VAX-11 EDT editor and automatic creation of data files matching the form definition.

FQL implements a key-optimizing general query processor capability, the spokesman said. The user can define which records are to be retrieved, for example, by filling in any combination of desired fields and then pressing the Retrieve key. FQL also supports a wild card capability for single and multiple characters, basic query operations and specialized operations.

Users can directly access VAX-11 RMS query processing routines through a call interface. Subroutines support multiuser general query access with concurrency control to ensure integrity, the spokesman said.

The package is supported on all VAX-11 operating systems with Version 3.1 or above and for all DEC VT100-compatible terminals. Introductory price for FDT and FQL is $4,200, with the call interface option priced at $2,800 from S9S1 Encina Road, Goleta, Calif. 93117.

Documentation Package Enhanced for System/34

NEW YORK — REM Associates has announced Release 3 of Remdoc, an IBM System/34 documentation package.

The new release features a precollated run book that merges nested procedures, flowcharts, operator messages, file usage, print and screen layouts in actual execution sequence by menu or procedure, a company spokesman said. Source and procedure narratives can be maintained with an on-line program and automatically merged into the run book.

A data dictionary can be automatically generated and then updated on-line to add field descriptions. File, input and output apecs can be produced directly from the data dictionary source member, the spokesman noted.

The package provides more than 20 reports integrating source and procedures from up to 30 libraries. The Release 2 price has been reduced to $600 with a free upgrade to the new release, which will be available September 1 from REM Associates, Box S27, Village Station, New York, N.Y. 10014.

Athena Offers WP Capabilities For Text Editor

EL CAJON, Calif. — Athena Software Services and Consulting Ltd. has announced an enhancement to its full screen text editor for Honeywell's Level 6/DPS 6 MOD400 systems.

FSTE-6/Plus features word processing capabilities that are said to enable current FSTE-6 users to utilize their terminals as word processing workstations.

FSTE-6/Plus features left and right text justification, automatic word wrapping, adjustable column length and paragraph reformatting, as well as underscoring, boldface, overtype and automatic pagination, according to a spokesman for the vendor.

Text effects reportedly appear on the screen using high/low intensity and reverse video terminal capabilities. FSTE-6 also includes a print facility and is compatible with all Honeywell CRTs, the vendor spokesman maintained.

FSTE-6/Plus carries a one-time license fee of $2,245. The upgrade alone costs $250.

More information is available from CDP Consultants, 1700 Circo Del Cielo Drive, El Cajon, Calif. 92020.

This announcement is neither an offer to sell nor a solicitation of an offer to buy these securities. The offer is made only by the Prospectus.

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April 28, 1983

Six Programs to Assist Info Managers

Consultants Unveil Problem Solution Package

HOUSTON — Walter E. Ulrich Consulting has announced the Problem Solution Package of Services, six separate programs designed to assist information managers with their most critical problem areas.

The six programs are:

- Backlog Reduction Program.
- Technology Advisement Program.
- Productivity Improvement Program.
- Problem Resolution Program.
- Personnel Enhancement Program.
- Personal Computing Program.

The Backlog Reduction Program is designed to help managers reduce their backlog of application programs. The Technology Advisement Program will assist in keeping current with information, communication and office technologies. The Productivity Improvement Program is intended for managers who must continue to provide high service levels while facing budgetary restrictions. The Problem Resolution Program is aimed at solving the underlying hardware, software and management problems facing the management information systems director. The Personnel Enhancement Program addresses an organization's intermediate and long-term needs for qualified personnel. The Personal Computing Program provides guidance on establishing end-user computing facilities for end users.

The vendor has organized a Problem Specification Analysis (PSA) team composed of managers and consultants. One or more team members is assigned to a client for from three days to a week to perform the PSA.

The charge for this component of the service is $3,000, plus expenses. Any additional services requested by the clients will be charged on a time and materials consulting basis, according to the vendor at Suite 450, 2626 S. Loop West, Houston, Texas 77054.

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NOMAD2 is widely recognized in the industry as the premier end-user oriented software product. Its report writer is unsurpassed and its graphic capabilities, relational properties and broad spectrum of built-in functions allow it to fully respond to end-user needs, no matter what those needs are. The in-depth training and support materials are exactly those used to support our NOMAD2 timesharing based business. Whether you're currently running an information center, or just thinking about setting one up, examine the options available to you and then talk to us. And the next time someone asks you how you respond to your end-users, tell them you do it with your in-house time-sharing business running NOMAD2.

For further information call Charles Graham at (203) 762-2511, or write to:

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Wang Offers Monitor Tool For VS Line

LOWELL, Mass. — Wang Laboratories, Inc. has announced System Activity Monitor (SAM), an interactive, menu-driven performance tool for the Wang VS product line that is said to enable users to fully analyze system capacity, measure existing performance levels and plan for future system resource requirements.

SAM allows users to maintain system performance by scheduling programs according to their frequency and system use. Users can obtain a graphics display of particular sections of program code that require reworking. They can also evaluate current system functionality for use in determining future operating requirements.

Four functions are accessible through the SAM main menu, allowing examination of task statistics of the overall system as well as CPU, disk and memory activity. They are: task statistics and profiles, task status and CPU utilization, disk status and utilization and memory status and utilization.

SAM runs on the VS 25, 45, 80, 90 and 100 systems and costs $1,000 from Wang at One Industrial Ave., Lowell, Mass. 01851.

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Comshare's DSS Gets Graphics, Forecasting

ANN ARBOR, Mich. — Comshare, Inc. has added integrated color graphics and statistical forecasting to its System W decision support system. System W runs on IBM mainframes under VM/CMS. A distributed version of System W links the mainframe package to the firm's Micro W software that runs on the IBM Personal Computer.

System W graphics allows charting of data from multiple dimensions of a company's data, such as line items vs. time by product, company division, geographic location or distribution channel. The new version of the product supports a variety of color-screen terminals, hard copy and 35mm slide-making devices.

Statistical forecasting features that have been integrated within System W include regression analysis, curve filling, descriptive statistics and histograms, the vendor said.

Color graphics and statistical forecasting are said to be the first of a series of planned additional features to System W. These functions are available immediately and will be provided free of charge to current System W users. The core package of System W is available for $55,000. System W Plus, which supports nine dimensions and 2,000 members per viewpoint, is priced at $75,000. System W Distributed, which includes two copies of Micro W, is available for $80,000. Additional copies of Micro W are priced at $995 each.

The vendor is located at 3001 S. State St., Ann Arbor, Mich. 48106.

Application Development System Unveiled

PHOENIX — Software Systems Marketing, Inc. has introduced an application development system combined with a relational data base management system for use with Data General Corp.'s DOS, Rdos, AOS and AOS/VS operating systems.

Consisting of over 200 programs, the Software Machine is an English language-based, menu-driven information management and application development system. The software features screen and report generators, a data dictionary, automatic relational file structures and an English query language with Boolean capabilities, the vendor said.

The Software Machine ranges in price between $9,000 and $24,000, depending on the operating system used. More information is available from the vendor at 4201 N. 16th St. No. 210, Phoenix, Ariz. 85016.

Prices Increased On Product Trio For VM Systems

ARLINGTON, Va. — VM Systems Group has announced price increases of 15% on three of its products for IBM VM systems. The increases will be effective June 1.

V/Quick is said to shorten VM/CMS "trivial" response time by speeding up paging for the interactive user. The new price is $5,740.

V/Snap gives a command that takes a dump produced by a hardware restart but without causing a system failure. It will cost $1,370.

V/Safe allows system operation to continue through most abend conditions without noticeable disruption, a spokesman said. It will cost $1,370.

VM is located at 3123 N. Military Road, Arlington, Va. 22207.

'IDA' Tool Out For System/38

WEST SPRINGFIELD, Mass. — New England Systems, Inc. has introduced an Interactive Documentation Aid (IDA) package for the IBM System/38.

IDA provides the capability to selectively produce standard documentation reports consisting of file record format layouts for physical, logical and display files, program file cross-reference listing and program narratives, according to a vendor spokesman.

Users can interactively produce system and program flowcharts utilizing a collective combination of International Standards Organization, American National Standards Institute and IBM flowcharting symbols, the vendor said.

Flowcharts are composed on-line, allowing inclusion of comments and function identifications, a spokesman said.

IDA reportedly also produces a printed listing of the user-composed system/program flowchart, the vendor said.

Documents can be produced by standard 132-char. IBM printers or letter quality printers, the vendor said.

The system is available at a licensed fee of $250.

New England Systems is located at 59 Interstate Drive, West Springfield, Mass. 01089.

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Application Program Generator Out for DEC

CORAOPOLIS, Pa. — Information and Systems Research, Inc. has announced an application program generator for Digital Equipment Corp. computers using DEC's Dibol and/or DBL under DEC's RT-11, TSX-Plus, RXS-11M, RSTS/E and VMS operating systems.

Called Rims/MPG-Plus, the package consists of eight key software modules and seven program generating modules which can be used to produce programs and source code for data entry, reports, sorts, transaction processing, graphics, menus and file reorganizations, a spokesman said.

Applications are generated by answering questions posed by Rims/MPG-Plus.

The dictionary module features multiple keys, redefine capabilities and hierarchical level grouping. Capabilities include partial key lookups, search on alternate keys and the ability to employ data types other then alphanumeric. Users can specify multiple dictionaries for the same data files.

Cross-reference chaining capabilities permit multiple data files to be accessed simultaneously. Any key data element can be subdivided into multiple contiguous data elements, thus defining a "split key," the spokesman said.

Repetitive definitions of a single data element can be created for subsequent use as a table or array.

Rims/MPG-Plus also allows for a number of data value and dictionary-integrity checks to be performed both during and after dictionary definition. Multiline report headers can be defined in the dictionary in order to conserve space on reports.

If ordered before June 15, a license fee costs $5,000 for RT-11, CTS-300 and TSX-Plus; $7,500 for RSTS/E, CTS-500 and RSX-11M; and $10,000 for VMS.

Prices will increase between 10% and 15% after June 15, the vendor said from Building One, Airport Office Park, 410 Rouse Road, Coraopolis, Pa. 15108.

Translator Program Converts Basic From Basic Four to HP

NEW YORK — Madlon Software Enterprises, Inc. has announced its translator and system packages for conversion from Basic Four Corp.'a Basic to Hewlett-Packard Co.'s Basic.

The translator program is written in HP Basic 3000 to run on any HP 3000 computer. The text of the Basic Four programs is first moved to the HP computer through telecommunications or on magnetic tape. The translator reads the programs as data and converts each line of Basic Four Code to an equivalent line of HP Basic code, a vendor spokesman said.

The file system is similar to the Basic Four file system, featuring direct, indexed and keys-only files. Variable length fields are allowed within records, and type mixing is also allowed. Up to 32 files can be opened at the same time, according to a vendor spokesman.

Madlon Software is located at Suite 1500, Two Penn. Plaza, New York, N.Y. 10121.

DBMS Unveiled For DEC PDP-11, VAX-11 Systems

DAYTON, Ohio — A data base management system (DBMS) for Digital Equipment Corp.'s PDP-11 systems running under RSX-11M and RSTS/E and VAX-11 systems running under VMS has been introduced by Data Base Software and Logic.

Amegatrim features interactive and batch access, report generation, nonprocedural English-like commands, data base reorganization and redefinition and transfer of data between data bases.

The package is priced between $1,500 and $4,000. The vendor can be reached through Box 53, Dayton, Ohio 45420.

Spreadsheet Targets IBM

FALLS CHURCH, Va. — Dexel Systems Corp. has announced a spreadsheet package for IBM's System/34, said to allow the user to perform basic spreadsheet processing.

The package features: spreadsheets of up to 26 col. by 70 rows; variable column widths, user-defined from one to 30 positions; full-screen spreadsheet display; spreadsheet print function; and formulas that may include add, subtract, multiply and divide operations, as well as references to other cell values, up to nine levels of nested expressions and four special cell commands.

The package costs $195 from Dexel Systems at 5203 Leesburg Pike, Falls Church, Va. 22041.

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System 1032 provides a commonsense relational approach to data management, without the burden of relational calculus or SQL. Users easily grasp both simple and complex data relationships, and assistance is right at their fingertips. Special function keys make it easy to complete commands, quickly learn new ones, and see explanations of options and parameters, even in mid-command. So there's no need to struggle with a manual in the lap or consult an already-hassled wizard.

Best of all, System 1032 is fast and pretty. It answers complex queries almost instantly and produces presentation-quality reports with single commands.

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Don't think it's a toy, though. Sophisticated applications designers can program in any VAX language, including System 1032's built-in block-structured language, and still access all of System 1032's powerful data management tools. A complete range of data types, format definitions, shared data structures, and other advanced features ensure that System 1032 easily satisfies the most demanding needs.

If you're a manager, you'll especially appreciate System 1032. Your users and programmers all use the same unified command language and data base concepts, so communication between them is easier than ever. And System 1032's careful human engineering drastically cuts your training costs and increases productivity.

Plus we exploit the best of the VAX architecture with shareable native code, asynchronous I/O, and proprietary inverted files—efficiently! So, unlike other software, System 1032 won't force you to buy more memory, disk space, or CPUs.

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Software House has an impeccable decade-long reputation for reliable software and responsive technical support. System 1032 is the offspring of System 1022,® the most widely used DBMS for DEC mainframes. Its step-oriented commands and relational design have proved themselves in years of use at hundreds of sites. And System 1032 has undergone extensive field-testing to ensure that it works right the first time for you. Although new, System 1032 is already the most mature DBMS available for your VAX.

Convince yourself. Try System 1032 on your own VAX with your own data, free for 60 days. Verify our claims, browse through our manual, and test our hot-line support service. Compare and benchmark System 1032 against other software, relational or not, at whatever price. Then sit back in bliss and watch your and users and programmers accomplish more, faster than you thought was possible.

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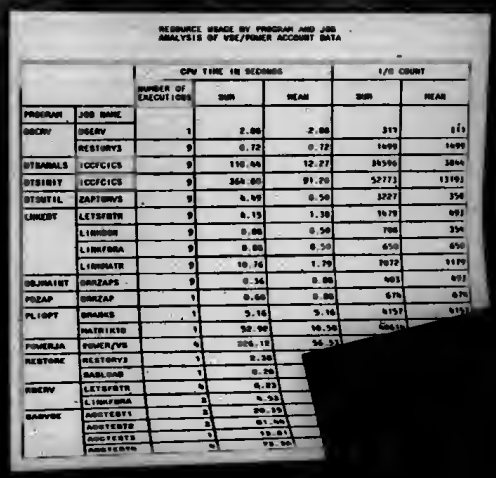

RESOURCE USAGE BY PROGRAM AND JOB
ANALYSIS OF VSE/POWER ACCOUNT DATA

			CPU TIME IN SECONDS		I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
PROGRAM	JOB NAME					
DSERV	DSERV	1	2.06	2.06	311	311
	RESTORV3	9	6.72	0.72	1499	1499
DTSBASLS	ICCFCICS	9	110.44	12.27	38596	3844
DTSIRIT	ICCFCICS	9	364.80	91.20	52773	13193
DTSUTIL	ZAPTSRVS	9	4.49	0.50	3227	358
LINKEDT	LETSFBTR	9	6.15	1.30	1679	691
	LIBNDDR	9	0.88	0.50	708	354
	LINKFORA	9	0.88	0.50	650	650
	LINKHATR	9	10.76	1.79	7072	1179
OBJMAINT	DBRZAPS	9	0.36	0.08	403	403
POZAP	DBRZAP	1	0.60	0.08	676	676
PL1OPT	BRAINS	1	5.16	5.16	6157	6157
	MATRIXYD	1	52.99	10.50	[illegible]	[illegible]
POWERJA	POWER/VS	4	226.18	56.57	[illegible]	[illegible]
RESTORE	RESTORV3	1	2.30			
	BABLOAD	1	0.20			
RSERV	LETSFBTR	4	6.23			
	LINKFORA	2	4.52			
SAMVDE	ADDTEST1	2	20.35			
	ADDTEST2	2	61.04			
	ADDTEST3	1	19.81			
	ADDTEST4	4	73.94			

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The SAS System is available outside the USA from the Institute's subsidiaries in Heidelberg, West Germany, Weybridge, Surrey, UK, Wellington, New Zealand, and Sydney, Australia, and from licensed distributors in Tokyo, Japan, Milano, Italy, Herzlya, Israel, and Singapore.

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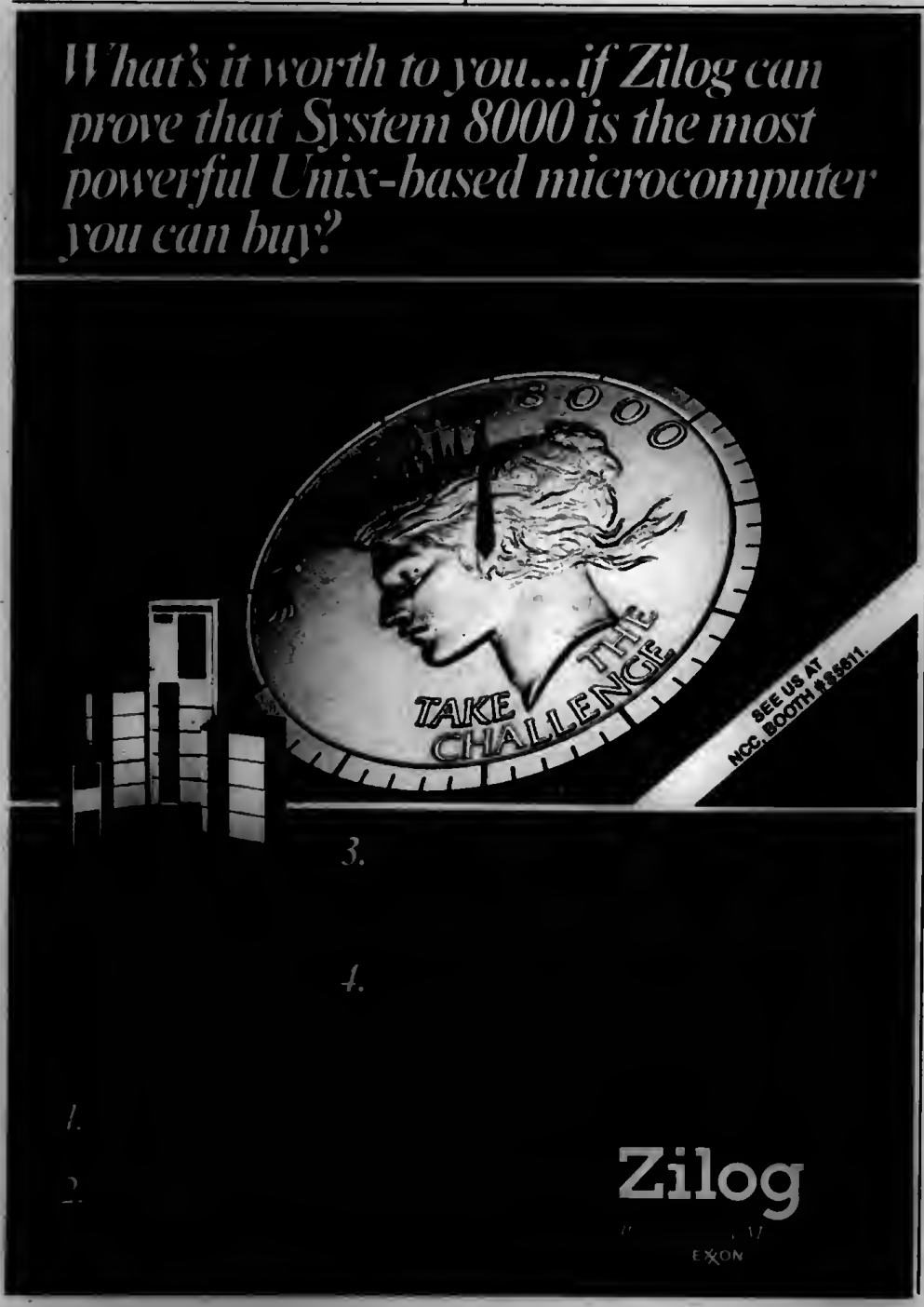
Features On-Line Maintenance

Ledger System Out in VAX Basic

SAN ANTONIO, Texas — Plycom Systems, Inc. has unveiled a general ledger system written in VAX Basic, designed to run on any Digital Equipment Corp. VAX-11 running the VMS operating system.

Features reportedly include menus, on-line maintenance of transactions and master files, accounting period orientation and automated period and year-end closing procedures. Reviewed annually by outside auditors, the system has an audit trail and conforms to all generally accepted accounting principles. Historical and budget reporting are both part of the standard system.

The general ledger system programs are available in source code along with documentation and complete technical and accounting support. Prices start at $7,500, from Plycom at Suite 150, 4243 Piedras E., San Antonio, Texas 78228.



'Template' Enhanced By Megatek

SAN DIEGO — Megatek Corp. has enhanced its Template interactive graphics software package with features designed to provide increased performance and improve productivity.

Template is a computer- and device-independent software package that provides the routines needed to create, display, modify and save graphics information for a variety of applications. Both two- and three-dimensional graphics can be accommodated in batch or interactive modes on most 32-bit or larger computers supporting Fortran, the vendor said.

Template Version 3.0's features reportedly include selective erase, polygon backface elimination and additional "save and restore" options. These features are said to extend Template's device intelligence — its ability to simulate a function not provided by the hardware of a display device.

Template Version 3.0 is a modular package available in several configurations ranging in price from $12,000 to $24,000, according to the vendor.

Existing installations will be field upgraded to include the new features of Version 3.0, Megatek said from 3985 Sorrento Valley Blvd., San Diego, Calif. 92121.

Package Fits HP MPE IV

ARLINGTON HEIGHTS, Ill. — Bakco Data, Inc. has introduced a purchasing application that runs under Hewlett-Packard Co.'s data base management system under HP's MPE IV operating system.

The package creates and modifies purchase orders, automatically updates inventory records, keeps track of open purchase orders, prepares receiving reports, monitors vendor performance and prepares cash commitment reports of open purchase orders, according to the vendor.

The package costs $9,800 from Suite 190, 85 W. Algonquin Road, Arlington Heights, Ill. 60005.

Available From Third-Party Vendors

Packages for Eclipse Released

WESTBORO, Mass. — Data General Corp. has announced two applications packages for its Eclipse computers that are available from third-party vendors under the company's Independent Software Vendor program.

The Bridge Virtual Microcomputer System from Virtual Microsystems, Inc. is a hardware/software system that simulates a Digital Research, Inc. CP/M software environment on DG Dasher terminals. It costs from $1,800 to $8,250 based on configuration.

Pass/Accu-Pay is a human resource management system designed to automate recordkeeping in personnel and payroll functions. Pass organizes personnel records in a prescribed format, and Accu-Pay calculates pay and produces pay-related registers.

The system is priced between $19,000 and $75,000, depending on modules chosen. More information is available from DG at 4400 Computer Drive, Westboro, Mass. 01581.

Scan200 Provides Economic Data

ANN ARBOR, Mich. — ADP Network Services, Inc. has announced an on-line service that makes the top 200 economic indicators available in a special-purpose data base.

Scan200 includes preformatted graphs and reports that enable the user to retrieve and view data in less than three minutes, a spokesman said. Data is updated daily. Scan200 also contains the forecasts of Townsend-Greenspan & Co., Inc., a consulting firm.

The data base is said to be customized to offer the indicators most widely used by business executives. Four types of graphs and three reports are available automatically. The service can also be used for forecasting sales and finances, developing corporate chart books and projecting costs. It can also be used to graph the user's data or any ADP Network Services data.

Charges are based on usage from the firm at 175 Jackson Plaza, Ann Arbor, Mich. 48106.

'Showdiff' Gives File Comparisons

BOULDER, Colo. — NOI Systems has announced an interactive file comparison program that runs on the Hewlett-Packard Co. HP 3000.

Showdiff is said to provide a line-by-line comparison of two Ascii files, displaying all differences found. The files may be line-numbered or unnumbered and may have record lengths of up to 216 characters, according to a spokeswoman for the firm.

The program is said to allow the user to control the comparison process by specifying the maximum number of differences and the minimum number of contiguous lines that must be identical in order for a match to occur.

Showdiff is priced at $395 for a single-CPU site and $495 for multiple CPU sites. More information is available from the vendor at Suite 505, 1677 Broadway, Boulder, Colo. 80302.

'Our Computer Won't Talk to Their Computer.'

File Processing Utility Targets HP 3000 Ksam

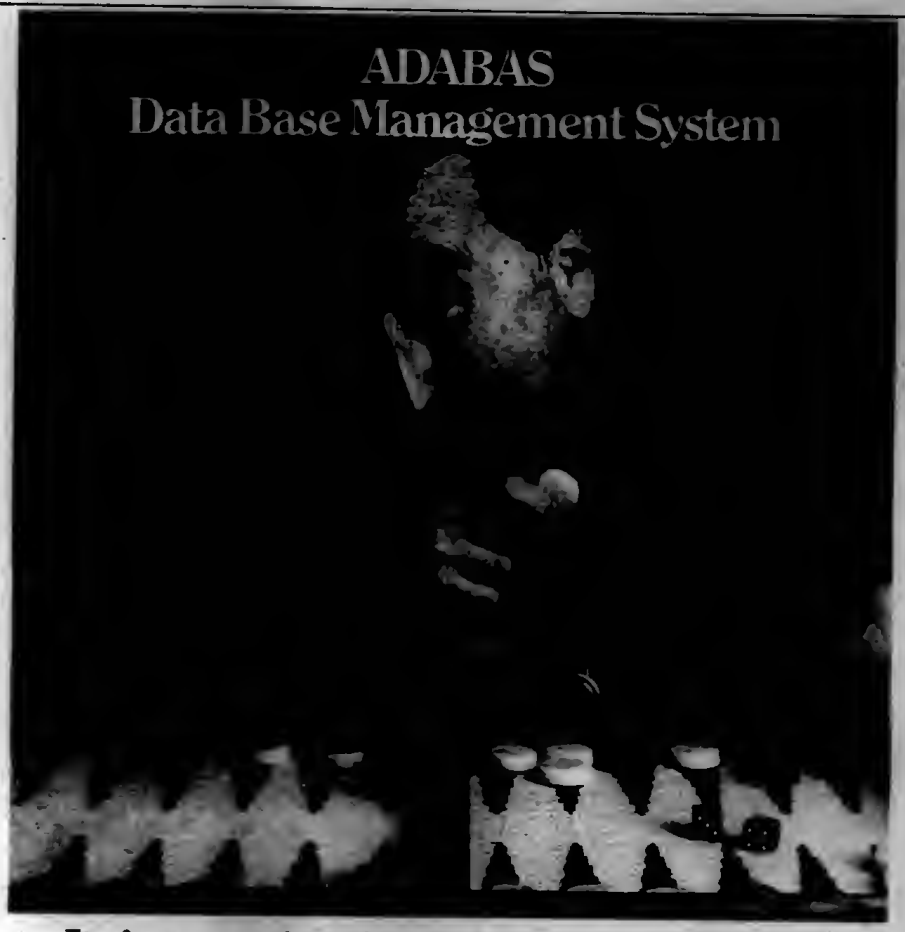
AUSTIN, Texas — Tymlabs Corp. has announced Copyrite, a file processing utility for the Hewlett-Packard Co. HP 3000 that is said to offer improvements in copying speed of HP Ksam files of up to 95%.

Copyrite reportedly separates the file building process into multiple sequential steps, resulting in faster file loads. Copyrite copies all data records to the Ksam data file through no-buffer, multirecord access I/O techniques. It then sorts all values for the first key using the system sort and performs a series of sequential writes to add the information to the key file, a spokesman said.

If more than one key is specified, Copyrite repeats the sort operation for each key.

If a user is operating in privileged mode, the utility extracts the key value for sorts while copying the data file records. It uses no-wait I/O and high-speed memory operations to move data between the extra data segments used as buffers and the stack.

Copyrite costs $2,000 with a 30-day demonstration tape priced at $100 from 211 E. 7th St., Austin, Texas 78701.



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CW 0516

Inspec Releases Guide For Users of Its Data Base

PISCATAWAY, N.J. — Inspec, the information division of the Institute of Electrical and Electronics Engineers (IEEE), has announced the publication of a new users manual to replace the "Inspec Data Base Users Guide" and provide a reference guide for all aspects of searching the Inspec data base.

The manual includes the subject coverage of the data base, the policy governing the selection of documents and the data elements contained in a typical record.

Detailed descriptions of the ways in which the data base is loaded on the various on-line systems and guidance on the effects of these on searching are reportedly provided, together with search examples illustrating techniques for searches.

The manual costs $70 from Inspec, IEEE Service Center, 445 Hoes Lane, Piscataway, N.J. 08854.

Series/1 'Subscript' Updated

RANCHO PALOS VERDES, Calif. — Academic Software Research Associates (Asra) has announced Release 1.2 of its IBM Series/1 Subscript text formatting system.

Subscript provides input, editing and formatting functions for letters, memos, documentation and reports. The new release adds password protection, electronic mailbox, extended editing and formatting functions and upward compatibility with the document preparation facility on an IBM mainframe

Subscript runs under Release 3.2 of the EDX operating system. It uses 24K bytes per session and requires no special terminal/printer configuration, a spokesman said.

The package costs $2,100 and is available through IBM or directly from Asra at 7010 Hartcrest Drive, Rancho Palos Verdes, Calif. 90274.

Reporting Tool Fits DEC VAX-11

NEW YORK — Enterprise Technology Corp. has announced the release of a generalized reporting system (GRS) for Digital Equipment Corp.'s VAX-11 superminicomputers.

GRS is a report writer, query and audit package designed for use with a variety of file formats and data base systems. It is compatible with applications packages from most major software vendors, as well as with systems developed by end users.

GRS is priced at a one-time fee of $6,500 under a perpetual license. More information is available from the vendor at 305 Madison Ave., New York, N.Y. 10165.

Prolink Unveils Ten Modules For Accounting

BOULDER, Colo. — Prolink Corp. has announced a series of comprehensive business management and accounting software modules that run on Prolink hardware.

The package, called Promas, consists of 10 modules written in Cobol, incorporating approximately 250 distinct programs. Modules can be installed separately and include general ledger, accounts payable, accounts receivable, payroll, order processing with invoicing, sales analysis, inventory control, bill of material with forecasting, purchase orders and job costing.

The system is said to be fully interactive, allowing on-line posting and inquiry and accommodating simultaneous use by multiple operators. Also, a controlled access feature ensures applications security, the vendor said.

Promas modules can be installed separately and have an average end-user price of $1,000, the vendor said. Prolink is located at 5757 Central Ave., Boulder, Colo. 80301.

Tymshare Offers Service for Banks

CUPERTINO, Calif. — Tymshare, Inc. has announced an application of its Ontyme electronic message network service to correspondent banking.

Called Financial Institution Communications System (Fics), the service allows data to be sent and accessed by word processors, small business computers or Tymshare's Scanset terminals. Fics provides an audit trail of all messages including dates and times they were sent and received. Messages need only be sent once, a spokesman said. Messages are stored automatically for two weeks at no extra cost.

Fics can be used in balance reporting, posting of prime rate changes, supplying information on loan participation opportunities, reporting of large dollar return items, execution of bond, security and other investment transactions, quotations of current investment rates and exchange of preformatted funds transfer instructions and acknowledgements between correspondent and respondent banks.

Prices vary according to use from Tymshare at 20705 Valley Green Drive, Cupertino, Calif. 95014.

Hitachi takes a big stride toward the smaller footprint.

Over 22 leading American and Japanese makers have agreed on a unified 3" compact floppy disk format for powerful reasons. These 3" floppies have 5 1/4" floppy capacity — 500 kilobytes — but are far more compact. A 3" floppy fits in the shirt pocket. Or standard mailing envelope.

Equally important, the drive now has a smaller footprint than ever before. It's quite light. And portable.

And new 3" compact floppy disks surpass any other format when it comes to protecting valuable data. The case is hard. You cannot bend the 3" floppy so data isn't destroyed. The dust-sealing and fingerprint-proof shutter opens automatically after insertion in the drive.

Hitachi is the first manufacturer to offer you quality drives for the 3" revolution. Hitachi has resources, experience and technological expertise second to none. Over one-quarter million Hitachi drives will be rolling off our quality-controlled lines this year. Wouldn't it be wise to have Hitachi dependability behind your products?

Specifications: Storage capacity unformatted 500 K bytes. Total no. of tracks: 80. Recording density: 8,948 bpi. Track density: 100 tpi. Transfer rate: 250 K bits/sec. Track-to-track positioning time: 3 ms/track. Dimensions (W × D × H) mm: 90 × 40 × 150. Wt.: 0.68kg.
HFD305D:double sided drive. HFD305S: single side drive with same specs if a double sided floppy is inserted again for the second side.

Floppy disk marked can be used with this floppy disk drive.

3" Compact Floppy Disk Drive HFD305

HITACHI

For further information:
Mr Takao Ichiki, Mid-Western Regional Office, Hitachi Sales Corporation of America, 1400 Morse Ave., Elk Grove Village, ILL. 60007 Phone: (312) 593-1550 Fax: (312) 593-2436
Mr T. Kodera, New Jersey Office, Hitachi America, Ltd. 58 Route 17, Allendale, N.J. 07401 Phone: (201) 825-8000 Fax: (201) 825-4781

Micronotes

An in-store service for microcomputer users consisting of an on-line data base of information on more than 21,000 software packages has been developed by PC Telemart, Inc.

Essentially the service will enable retailers and their customers to conduct searches of the data base while in the stores to determine what software is available, obtain descriptive information and, in some cases, order the products electronically.

The vendor plans to launch a market test of the service with participating retailers in the Washington, D.C., area next month, to be followed by nationwide distribution of the service on a rental basis in the form of in-store booths complete with terminals and printers. Organizations which qualify as national accounts reportedly can access the Telemart service through a communications network such as Tymnet directly from PC Telemart headquarters in Fairfax, Va. In addition, software problems or questions will be handled through an electronic bulletin board, and the vendor plans to include reviews of the most popular software packages on-line.

The PC Telemart Services will be supported by the firm's PC National Software Library, which houses a collection of microcomputer software and hardware required to demonstrate and evaluate the software packages. The library will officially open this summer, the vendor said, and will be available to retailers, organizations and individual users on a subscription or fee basis.

PC Telemart, Inc. is headquartered at 11781 Lee Jackson Highway, Fairfax, Va. 22033.

Peachtree Software, Inc. has announced **Peachtext 5000** for users of IBM's Personal Computer. The package incorporates word processing, financial planning and data base management functions and costs about $1,995, the vendor said from 3445 Peachtree Road, N.E., Atlanta, Ga. 30326.

Dunbar-Ridge Corp. has announced **Filedriver**, a set of file-handling utilities for users of Digital Research, Inc. CP/M Release 2.2 and MP/M II operating systems, as well as the Turbodos operating system offered by Musys Corp. Features include the ability to access 31 user areas, automate user-designed operations and file movement between user areas without copying. Filedriver costs $75, the vendor said from 102 Sterling Court, Syosset, N.Y. 11791.

K & S Associates has announced **Disassem**, an assembler program for the Radio Shack TRS-80 Model II. The package takes binary code and converts it to assembler source code. The package costs $49.99, the vendor said from 202 Park Ave., Bloomfield, Conn. 06002.

Alpha Software Corp. has announced **Data Base Manager II** for the IBM Personal Computer. Features include an integrated spreadsheet and word processing package with data base capabilities. The package costs $295, the vendor said from 12 New England Executive Park, Burlington, Mass. 01803.

Stoneware, Inc. has announced that its **DB Master** data base management package is now available for the IBM Personal Computer. Features include printing on various forms, an integrated text editor and report generator and an array search facility. The package costs $499, the vendor said from 50 Belvedere St., San Rafael, Calif. 94901.

'Jumper Cables?'

Sperry Corp. has announced its **UTS 40** intelligent terminals can now use Digital Research, Inc.'a CP/M Plus operating system. The CP/M Plus option is available for a $300 extended term charge from the firm through P.O. Box 500, Blue Bell, Pa. 19424.

N.F. Systems, Ltd. has announced **Release 1.0** of its **Hostcomm** communications program for IBM Personal Computers. The new package includes the ability to operate at either 300 or 1,200 bit/sec. The package costs $170 from the vendor through P.O. Box 76363, Atlanta, Ga. 30358.

Interactive Technology, Inc. has announced it has reached an agreement with Hamilton Micro Systems, Inc. to offer **Hamilton'a RDM 300 applications development package** to users of Digital Equipment Corp.'a Professional 350 microcomputers. The package reportedly allows end users to develop programs and offers word processing and spreadsheet analysis functions. It costs $995, the vendor said from Suite 103, 1225 N.W. Murray Road, Portland, Ore. 97229.

Prairie Data Systems, Inc. has added the **Multiplan Spreadsheet Link** to its Financial Reporting System. The packages can run on a variety of microcomputers including the IBM Personal Computer, Xerox Corp. 820, Radio Shack TRS-80 Model II and Digital Equipment Corp. Rainbow. The spreadsheet link allows users to send financial statements directly from the Financial Reporting System to the spreadsheet package for further analysis. The combined Financial Reporting System with the Multiplan Spreadsheet Link costs $1,040. For current users of the Financial Reporting System, the Multiplan Spreadsheet Link alone costs $200, the vendor said from 202-626 Broadway Ave., Saskatoon, Sask., Canada S7N 1A9.

Bytel Corp. has announced its **Cogen program generator** and **Menupro menu processing package** can be used on microcomputers manufactured by Pixel, Inc. under the Bell Laboratories Unix operating system. Cogen is a program generator for business applications. The package costs $950 and reportedly cuts program development time. The Menupro package provides a structured method for microcomputer menu design. It costs $250, the vendor said from 1714 Solano Ave., Berkeley, Calif. 94707.

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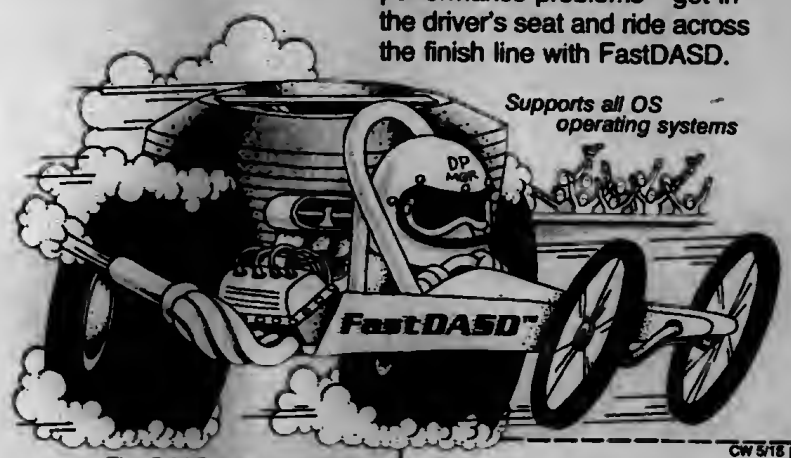

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Remote Computing Costs Compared in Study

(Continued from Page 91)

vices in the RDC report, and its TSO service ranked fourth among the seven TSO services. The researchers reported that the costs of these services is within 2% of the mean for similar operating environments represented in the report. In addition, the run costs for IBM's Information Network are said to be impacted currently by the requirement to record each individual run separately. It was anticipated that a modification of this policy to a more standard industry costing procedure would further improve their comparative position.

Of the 23 runs made to compare hardware groupings, the CDC and Decsystem-20 groups averaged the lowest cost on 11 each, with the other first place taken by the Honeywell, Inc. grouping.

While CDC and Decsystem-20 services proved to be the least expensive for CPU costs, storage costs were shown to be clearly lower on services utilizing IBM hardware. Those services that ranked in the lowest quarter for storage costs were all standard IBM VM/CMS or MVS/TSO offerings. Fifteen of the 16 CMS and TSO services were in the lowest half of the services compared.

On the basis of individual services, Sun Information Services Co.'s Cyber offering generated the most first places this year, followed by the Decsystem-20 offering from Landart Systems, Inc. of New York.

In addition to the detailed cost analysis, the RDC report provided an informational overview of each vendor'a facilities, support services and standards of performance.

A new feature this year is a section that reports on the software and services offered for microcomputers. Over 63% of the services have addressed the "micro revolution," the researchers noted, listing the methods they have used as follows:

- A proprietary hardware/software approach that is practiced by relatively few of the time-sharing services due to the expense factor.
- A specific product/services approach with interfaces provided to selected software products only.
- A decision aupport software approach that includes support for specialized micro products as well as micro-mainframe interfaces for distributed processing.
- A "lowest common denominator" approach, which is support for the standard array of micro software plus off-line data collection capabilities.

The cost of the RDC report is $995 plus postage and handling. RDC is located at 123 High Ridge Road, Stamford, Conn. 06905.

VENDOR	REPORT REFERENCE	HARDWARE
General Electric Informatine Services Company		
• MARK III Foreground	GEISCO/Foreground	Honeywell
• MARK 3000	GEISCO/MARK 3000	IBM
Honeywell Information Systems, Inc.	HIS	Honeywell
Informatics General Corporation	Informatics	IBM
International Business Machines Information Network		
• VMPS Service	IBM IN/VMPS	IBM
• MVSPS Servicn	IBM IN/MVSPS	IBM
Landart Systems, Inc.	Landart	DEC-20
McDonnell Douglas Automation Co.		
• DAC-II Service	McAuto/DAC-II	CDC
• TSO Service	McAuto/TSO	IBM
National CSS	NCSS	IBM
Rapidata	Rapidata	DEC-10
Ross Systems, Inc.	Ross	DEC-VAX
Sun Information Services		
• CMS Service	SIS/CMS	IBM
• Cyber Servicn	SIS/Cyber	CDC
• TSO Service	SIS/TSO	IBM
Timesharing Consultants, Inc.	TCI	DEC-20
Time Sharing Resources	TSR	IBM
Tymshare, Inc.		
• Tymcom-X	Tymshare/Tym-X	DEC-10
• Tymcom-370	Tymshare/Tym-370	IBM
United Information Servicne Inc.		
• Apex	UIS/APEX	CDC
• AS-6/370	UIS/AS-6	IBM
• DEC-10	UIS/DEC-12	DEC-10

Additional Vendors in RDC Study

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M&G Software Services Inc. 18 McAuliffe Road, Randolph, MA 02368

Disk Aid Fits RSX-11M-Plus

BERKELEY, Calif. — Proto Systems has made its D-M-Driver disk emulation software available on Digital Equipment Corp.'a RSX-11M-Plus operating system.

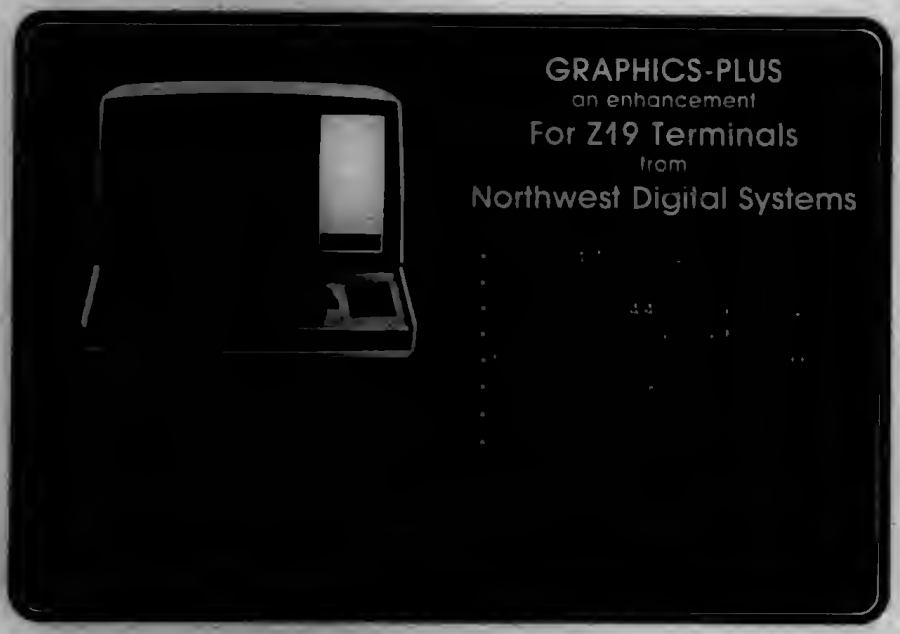
The company also announced CP/SIM, a set of programa and utilities that allows a DEC VAX/VMS-based system to execute programs designed for Digital Research, Inc.'a CP/M operating system.

D-M-Driver offers use of a portion of memory as a disk aubstitute without adding additional hardware, the company said. It can be configured as a aingle-disk unit with the number of disk blocks limited by the available physical memory allocated. A practical range of equivalent disk sizes is from 64K bytes to 3.75M bytes. The complete package costs $550.

CP/SIM's simulated CP/M environment is that of an Intel Corp. 8080 microprocessor with 64K bytes of memory. The file system is that normally used by VAX/VMS, a spokesman said. The CP/M environment provides access to the VAX disks, increasing storage available for CP/M programs and allowing features such as version numbers, date time stamps and file protection to be employed.

The package includes a CPX utility for transfer of files between a CP/M formatted disk and the host VAX. It can also reportedly be used to convert file formats on the VAX itself.

The complete package costs $2,400 from Proto Systems, 1238 Josephine St., Berkeley, Calif. 94703.



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The FIFT GEN

H NERATION

IN DEPTH

An American Response

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In an otherwise unremarkable office building in Tokyo, a group of highly dedicated young researchers is engaged in designing a new computer generation that will transform the way the Japanese work, whether they are fishermen or powerful business executives, farmers or shopkeepers, scientists or schoolchildren. The vehicles of revolution are to be known as knowledge information processing systems, or Kips.

This new generation of computers will be more powerful than any other the world has seen — indeed, by orders of magnitude. But their real power will lie not in their processing speed but in their capacity to reason. They will reason, moreover, with enormous amounts of information that will be constantly selected, interpreted, updated and adapted as circumstances change those facts. Kips are intended to bring knowledge — large amounts of it, tailored to any given user's needs — to any task a user might wish to do.

The Japanese expect these new computers, which users will be able to speak with in everyday conversational language, or show pictures to, or transmit messages to by keyboard or handwriting, to penetrate every level of society. They will assume no special expertise or knowledge of arcane programming languages. They will not even require the user to be very specific about his needs, because they will have reasoning power and will be able to tease out from the user, by questioning and by suggestions, just exactly what it is the user wants to do or know. Finally, these new machines will be inexpensive and reliable enough to be used everywhere: in offices, factories, shops and, of course, homes.

The Japanese expect these computers to be the kind most generally in use worldwide by the 1990s. They expect such powerful reasoning and knowledge processing to transform their society — and save it, too. Because they see no economic alternative in the long run, the Japanese will not only broker knowledge itself to the world, but they will also sell products and services whose design is so knowledge-intensive that their superiority must claim a large proportion of world markets.

By the beginning of the next decade, the Japanese plan to be well on their way to utilizing the amassed knowledge of human civilization as their leverage to achieve a preeminent role in world trade. Other developed nations, in particular Great Britain and France, recognized the wisdom of the Japanese plan and are undertaking strategies of their own. Each such plan,

(Continued on In Depth/6)

IN DEPTH

A Proposal for Action by the U.S.

As Americans, we are not without alternatives, however unpalatable the reality of some of them may be. *Our* own first choice would be a center for knowledge technology.

The U.S. is not Japan. The U.S. Commerce Department is not the Ministry of International Trade and Industry, and the Pentagon should not be, even by default. Nearly everyone in the information processing industry agrees that some sort of cooperative effort is necessary to ensure well-educated researchers, fruitful research and an end to the frittering away of resources in short-term get-rich schemes that benefit the very few. We do *not* have unlimited resources of any kind, and other nations are moving off into a future where we must follow whether we like it or not, but where we could lead if we wanted.

Though there have been several different attempts by industrial groups to pool certain resources, good intentions have been frustrated by a deeply ingrained tradition of commercial competition (legally reinforced by means of strict antitrust laws), by the lack of any suitable framework in which to carry out cooperation and by the lack of widely shared national goals.

One eminent scientist has quite seriously suggested that all who are concerned about the Japanese fifth generation should put all their energy into persuading our own great national resource, IBM, to take on the task of competing with the Japanese project — that IBM is our best hope. Though the idea has its beguiling aspects (not to mention its bizarre ones), it seems a bit fanciful. Moreover, it would give to one firm an exclusive command over a technology that many firms ought to share, as the Japanese have recognized.

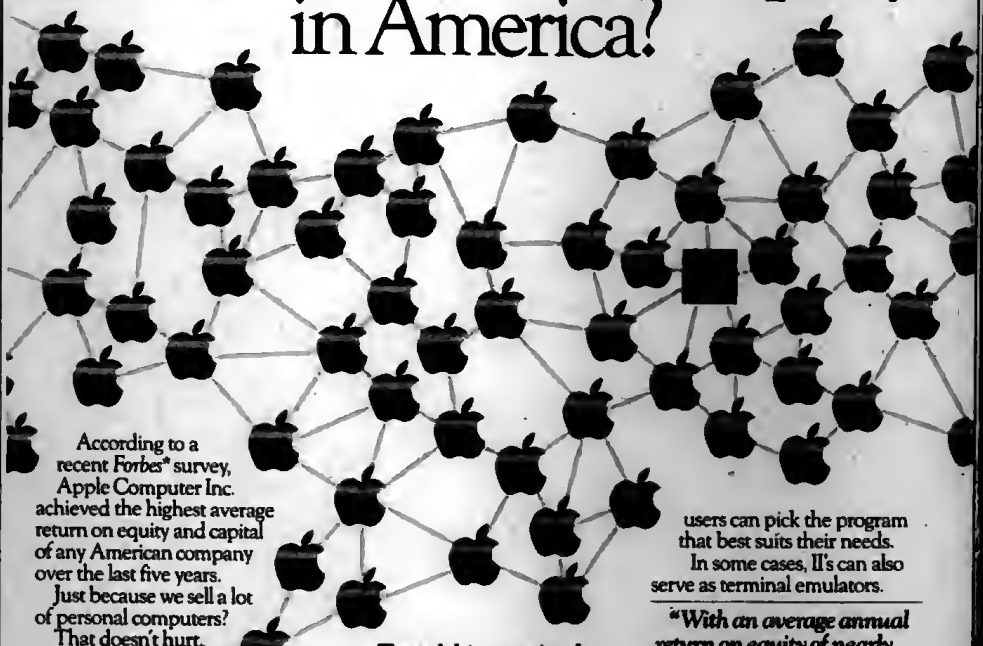
Let us make another proposal. The U.S. should form a national center for knowledge technology. By "knowledge technology" we mean computing, certainly, but we also mean other related forms of knowledge distribution, such as libraries, for which there are important technological needs and exciting opportunities. This idea of a national center of knowledge technology isn't original with us; industrialists, educators and government officials have all suggested variations on the idea.

An alternate form of the plan would be a national center for information processing technology, conceived recently by a senior government science administrator. It would cut more deeply into the world of technology but less broadly across the world of knowledge systems. This center would not compete with industry. On the contrary, it would play a role similar to that of the Advanced Research Projects Agency (Arpa), supporting the kind of basic research no single firm or even group of firms can afford to risk. Like Arpa, it would fund and coordinate high-risk projects through their early research stages until industries could take the results into the development stage. Its responsibilities would be long-term results, not short-term profits. Thus its funds might come from all who would stand to gain from such a center in both the public and the private sectors. Funding has to be generous, the amount to depend on how widely or narrowly knowledge technology is construed.

If it is narrowly construed, a pilot project something like the Japanese fifth generation might be undertaken — we certainly believe the U.S. owes it to itself to continue the research it pioneered, to develop it and to reap its obvious benefits. But if the center is broadly construed, it would embrace research in an enormous complex of information and knowledge technologies, from telecommunications to publishing, from new

First in a series of reports on the role of personal computers in the office.

What's the secret behind the most profitable company in America?



According to a recent *Forbes** survey, Apple Computer Inc. achieved the highest average return on equity and capital of any American company over the last five years.

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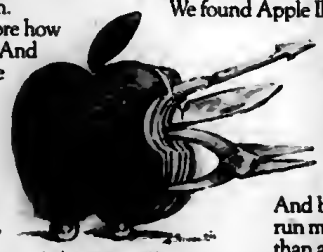
At Apple, we put Apples on every desk. The nature of the work determines the nature of the Apple. We found Apple II's (and now Apple IIe's) to be the most affordable solution for most of our dedicated, ready-to-run applications. And because they run more software than any other personal computer, users can pick the program that best suits their needs.

In some cases, II's can also serve as terminal emulators.



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The III can also serve as a sophisticated terminal emulator. (Apple's new Protocol Converter can handle most 3270 series terminals, so any Apple can communicate with mainframes — in our case, an IBM 4341-2.)

A National Center for Knowledge Technology

computer designs to new curriculum designs for our schools. Eventually it must assign priorities to national research and take the difficult step of setting standards flexible enough for new technology to be accommodated, yet stern enough to avoid the wasteful incompatibilities we have seen, for example, in videodisks and computer software.

Though funds must come first from the government, this agency should not come under the government. The civil service salary structure cannot cope with the need, and the civil service machinery is too ponderous to allow the center to work with the speed and suppleness it must have. Indeed, it should probably be staffed by people on loan from firms, research laboratories, universities and other talent pools.

The difficulties are obvious. How are intellectual property rights to be properly assigned and rewarded? Common law has a long tradition of dealing with real property, but its dealings with intellectual property have been uninspired. We have already talked about the dearth of qualified scientists and engineers in AI and the rest of computer science, and such a center would drain talent from universities and other research laboratories. But this is a problem, like the problems of intellectual property rights, that our society will have to face anyway. The establishment of a center might in fact help in the solution. How is technology to be transferred effectively from the laboratory to industry? How is a high level of innovation to be maintained? There are other serious problems, but what choice do we have?

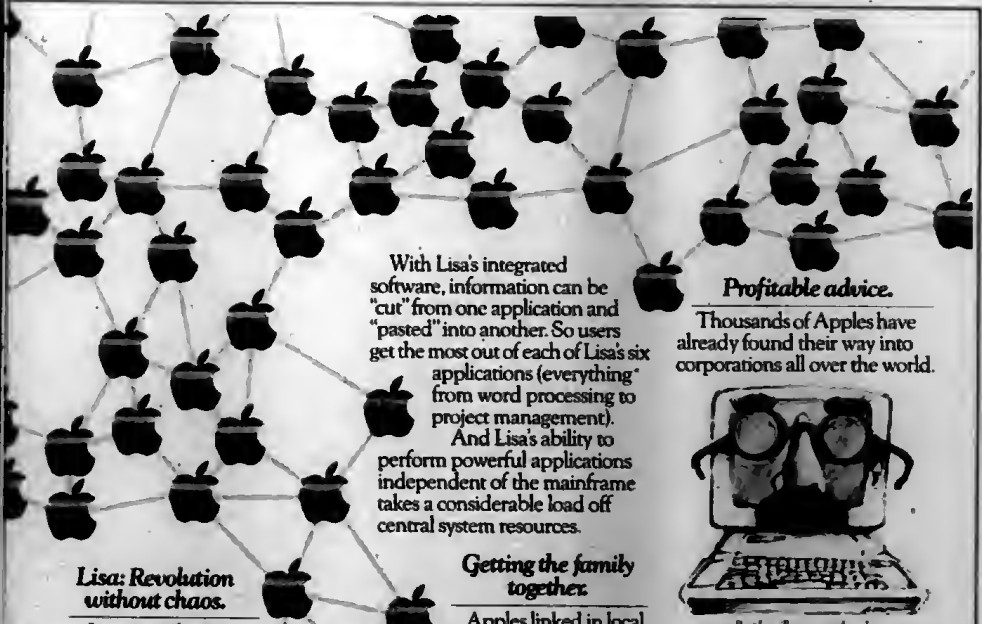
The center we propose would be an expression and institutional embodiment of national will, much as the Kennedy and Manned Spacecraft Centers of Nasa have been. There has never been an organization like it in the U.S. Projects of this magnitude have been government- or military-controlled, as, for example, the space program was. But then there has never in our history, or in the history of the world, come such a sudden and profoundly exciting opportunity.

We have the opportunity at this moment to do a new version of Diderot's *Encyclopedia*, a gathering up of all knowledge — not just the academic kind, but the informal, experiential, heuristic kind — to be fused, amplified and distributed, all at orders of magnitude difference in cost, speed, volume and *usefulness* over what we have now.

What faces us, if you like, is the Louisiana Purchase in the manifest destiny of computing.

Should our knowledge technology goals continue to be set only by the military, certain compromises must occur. First, such research might become strategic, subject to government regulation, which would mean an end to the rapid and free exchange of ideas that has so enriched the early work in AI, knowledge systems and computing in general. Second, research might eventually be skewed primarily toward military objectives. Military and civilian goals can be harmonious, but they are different.

If, of course, Americans can only bear the burden of financial support in the name of national defense, we can call it national defense. We built the interstate highway system in the name of national defense, and with the same justification we educated a generation of college students in everything from Asian art to zoology. In a national center for knowledge technology, we are suggesting no more than insurance in a world where other nations have already perceived the centrality of knowledge to their self-interest and are acting upon it.



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*Forbes 35th Annual Report on American Industry, Jan. 3, 1983. Note: The same survey also found Apple to be number one in sales and profit growth. For information regarding corporate purchases through our National Account Program call (800) 538-9696. Or write: Apple Computer Inc., MIS/EDP Marketing Dept., 20525 Mariani Ave., Cupertino, CA 95014. ©1983 Apple Computer Inc.

IN DEPTH

(Continued from In Depth/3)

including Japan's, revolves around development of a new technology that embodies knowledge as its central feature — knowledge that will transform its holder's small advantage into a powerful, eventually decisive advantage in any competition.

The U.S., which pioneered the technology each of these national plans is based upon, and which has been preeminent in information technology for decades, has no such plan. A few industrialists and government officials are alert to these programs abroad and understand the consequences if the U.S. makes no rational plan of its own. But on the whole, Americans are remarkably indifferent to, even ignorant of, the challenges to the U.S. predominance in everything from computing to finance, industrial output to quality of life, that these other plans represent. We are, as usual, relying on matters to take care of themselves. Because information technology moves so much faster than other kinds of technology — halving in price and doubling in power every two years on the average — matters aren't likely just to take care of themselves in ways that Americans will be altogether happy with.

Expert Systems And Knowledge Engineering

To answer in some detail the question of just what the Japanese plan to do, it is important to understand something at the heart of the fifth generation, the applied side of artificial intelligence (AI) called knowledge-based systems. What knowledge-based systems are, how they came about and how they are still under development are the themes to be explored.

In some sense, all artificial intelligence is applied, because unless experimental results confirm theory, unless a program exhibits the intelligent behavior it is meant to exhibit, the theory has less credibility. But knowledge-based systems have a particularly strong flavor of the applied because they are characterized by large amounts of specific knowledge. A speech-understanding system, for example, not only will know what the subject matter under discussion is (and various facts about it) but will also have semantic, syntactic, lexical, phonemic, phonetic and pragmatic knowledge about the language the speech is being spoken in, will know things about the vocal habits of the specific speaker it is listening to and so on.

We have already remarked that a shift took place in AI research over the past two decades. It was a shift from a search for broad, general laws of thinking toward an appreciation of specific knowledge — facts, experiential knowledge and how to use knowledge — as the central issue in intelligent behavior. This shift came not as a consequence of irrefutable arguments that immediately persuaded all researchers by their cogency and correctness. Rather, the shift came about because demonstration projects that used large amounts of specific knowledge simply worked.

The project that began AI's shift to the knowledge-based viewpoint was Dendral, an expert system that was able to infer chemical structure from data available to physical chemists.

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The effort began in 1965, shortly after Feigenbaum's move to Stanford University. There he met a kindred scientific soul, Joshua Lederberg, a professor of genetics and Nobel laureate, who had long been fascinated by the possible uses of computers to model and to assist scientific thinking. Together they began to write the reasoning programs that could infer molecular hypotheses from chemical data.

They saw immediately that the programs could not perform in an effective, practical, expert manner without considerable knowledge of physical chemistry. So Lederberg recruited the talents and expertise of Carl Djerassi — well known as a physical chemist, but even better known as "father of the birth control pill" — from the Stanford chemistry department. The interdisciplinary team from computer science, genetics and chemistry labored for years to produce an expert system so knowledgeable and effective that its ability to explicate the details of molecular structure from chemical data now exceeds human capability, including that of its designers. Dendral has been in use for many years at university and industrial chemical labs around the world.

Early Responses

Despite its obvious power and utility, Dendral did not meet with immediate universal acclaim. McCorduck remembers hearing Feigenbaum lecture in the early 1970s at Carnegie-Mellon, where he was talking about Dendral and, more important, talking about the usefulness of the knowledge-based approach to artificial intelligence.

Feigenbaum's lecture was an interesting occasion for many reasons. He had done his graduate work at Carnegie and his thesis advisor and spiritual father, Herbert Simon, whom he deeply admired, was in the audience. Beside Simon was Allen Newell, another artificial intelligence great, and scattered about the room were some of the best and brightest in computer science in general and artificial intelligence in particular.

But the Carnegie mood was skeptical, if not atheistic, when it came to the idea of knowledge-based expert systems. If artificial intelligence were to become a science, it ought to have discoverable grand and universal laws, like physics and chemistry.

Feigenbaum talked about Dendral and then threw out a challenge. "You people are working on toy problems," he said. "Chess and logic are toy problems. If you solve them, you'll have solved a toy problem. And that's all you'll have done. Get out into the real world and solve real-world problems."

Now, AI workers had not chosen simplified — or "toy" — problems just to be perverse. It is sound science strategy to choose a simplified problem and explore it in depth to grasp principles and mechanisms that are otherwise obscured by details that don't really matter. But Feigenbaum was arguing to the contrary, that here *the details not only mattered; they made all the difference.*

There were murmurings among the graduate students. Maybe Feigenbaum was right. Maybe if you built a smart chess machine, all you had in the end was . . . well, a smart chess machine. And not immediately, but later, Carnegie-Mellon came around, and a group of Carnegie researchers built remarkable knowledge-based systems, Hearsay and Harpy, to understand continuous human speech. The vocabulary was limited and the aystems moved less than gracefully between one speaker and another, but in their limited way they worked. Much more important, they provided some useful ideas about how knowledge might be arranged and used and improved upon. There would be more such systems to come from Carnegie-Mellon scientists.

The modeling of mind by mechanism — artificial intelligence and its sibling, cognitive science — has traveled many paths and a great distance in its first quarter-century. The paths have converged on the central thesis that understanding, problem solving, all the other functions of intelligence, even learning, are all crucially dependent upon knowledge. One must know first in order to be able

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IN DEPTH

to understand later. One must even know first to be able to know more later.

Domains of the Experts

Knowledge-based systems, to labor the obvious, contain large amounts of varied knowledge which they bring to bear on a given task. Expert systems are a species of knowledge-based system, though the two terms are often used interchangeably.

To demonstrate the usefulness of expert systems, we will survey the range of fields where they have been applied already.

Perhaps the largest single group of expert systems is centered in medicine. The most knowledge-intensive expert system in existence is the Internist/Caduceus system at the University of Pittsburgh, the creation of a physician, Jack Meyers, and a computer scientist, Harry Pople. Internist/Caduceus (known informally as "Jack in the Box") does diagnoses in internal medicine at a level of expertise that allows it to solve most of the CPCs, or clinical pathological conferences, that appear in the *New England Journal of Medicine* and constitute a kind of test-your-wits quiz for doctors.

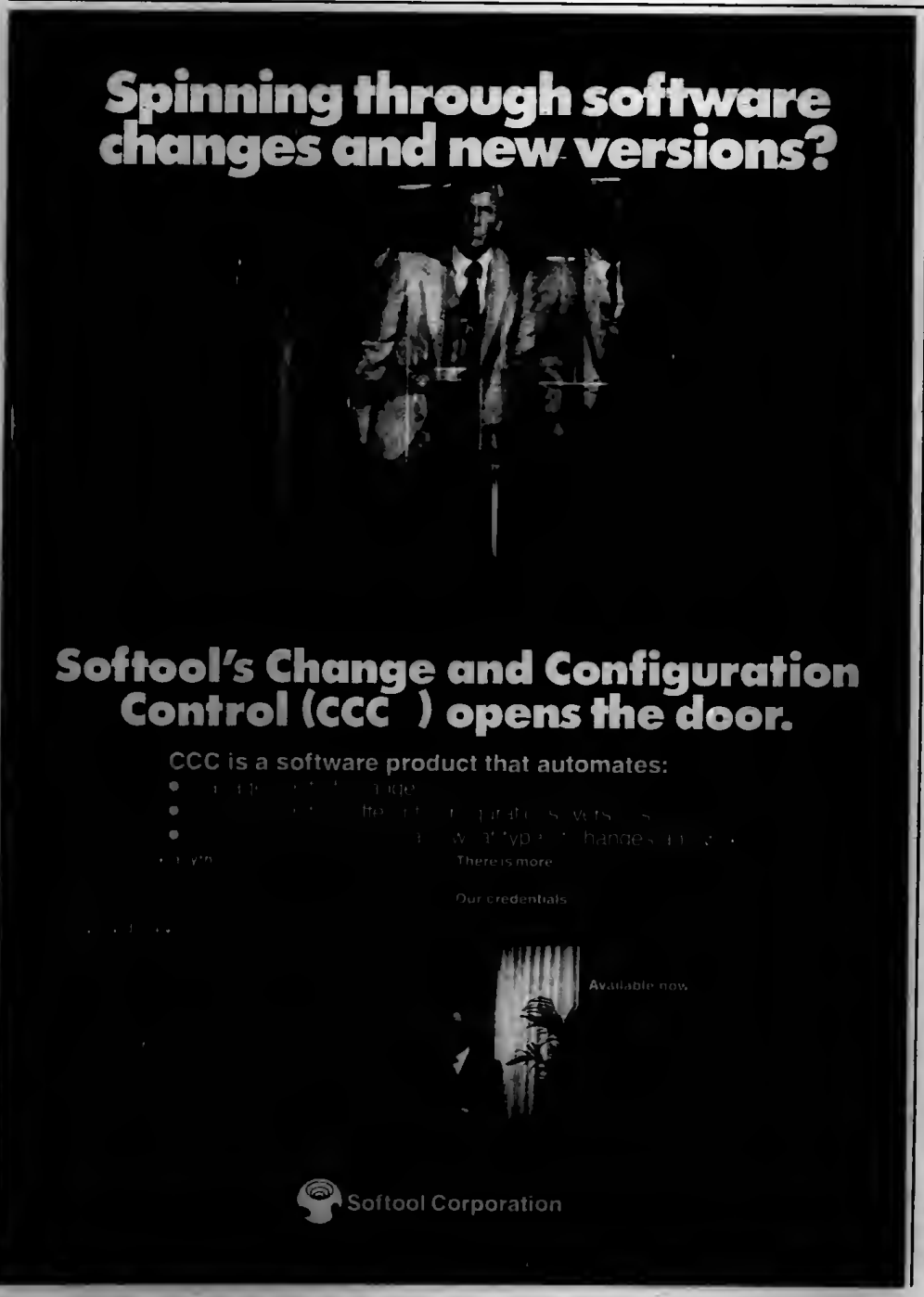
By now, Internist/Caduceus covers more than 80% of all internal medicine; its knowledge base encompasses about 500 diseases and more than 3,500 manifestations of disease. It will soon undergo formal clinical trials.

At Stanford University, several medical expert systems have been designed. Mycin diagnoses blood and meningitis infections, then advises the physician on antibiotic therapies for treating the infections. Like every other expert system, Mycin acts as a consultant having a conversation with its user, the physician. The physician supplies the patient history and laboratory test results — external data the computer could not possibly infer — and then the program begins to reason about possible diagnoses.

Still other expert systems in medicine exist for digitalis dosing, glaucoma diagnosis and treatment, renal disease, arthritis and rheumatism, fetal illnesses and even the development of new drugs.

In biology, an expert system called Molgen, for Molecular Genetics, gives advice on gene cloning in genetic engineering and helps molecular biologists analyze DNA sequence data. Molgen will take a statement of the goal of a gene cloning experiment from a genetic engineer and produce one or more plausible experiment plans for achieving that particular cloning — advising on the details of the necessary but intricate steps that must be performed in the lab to achieve the cloning.

Knowledge-based approaches to speech and image understanding by computer have been under way for some time. Understanding of continuous speech (as opposed to mere recognition of individual words) started at Carnegie-Mellon and other places in the 1970s and began to be successful when designers were able to add context — knowledge of the topic in addition to knowledge of speech and linguistic



acts — to the process of understanding. Speech understanding is a special case of a more general problem called signal understanding. Signals can come from any instrument, not just a microphone or a TV camera.

A defense-related application of expert systems in signal interpretation, whose essentials are no longer classified, is Hasp/Siap, a passive sonar surveillance system designed to interpret ocean sounds in very noisy circumstances. To do this by conventional computing methods using statistical techniques, expensive supercomputers would be needed, and even then it is questionable whether the problem is tractable. It made no sense to spend the computing time of a supercomputer, doing cross-correlations and autocorrelations of signals in a massive amount of sonar data when, in fact, most of the information needed for the correct interpretation wasn't present in that signal but was to be found in the knowledge surrounding the situation. What knowledge? The hefty intelligence manuals on a shelf, information from spies, what the neighboring station saw yesterday, what's normal, the fact that it's winter and not summer, what the

Systems as Intellectual Support

An expert system is a computer program that has built into it the knowledge and capability that will allow it to operate at the expert's level. Expert performance means, for example, the level of performance of M.D.'s doing diagnosis and therapeutics or Ph.D.'s or very experienced people doing engineering, scientific or managerial tasks. The expert system is a high-level intellectual support for the human expert, which explains its other name, *intelligent assistant*.

Expert systems are usually built to be able to explain the lines of reasoning that led to their decisions. Some can even explain why they rejected certain paths of reasoning and chose others. This transparency is a major feature of expert systems. Designers work hard to achieve it because they understand that the ultimate use of the system will depend upon its credibility to its users, and credibility will arise because the behavior is transparent, explainable.

The dual usage, "knowledge-based systems" and "expert systems," violates the precision some scientists favor. In brief, a system that can understand images or speech may rely on a large knowledge base to achieve its perceptions, but it doesn't call on any special human expertise to do it. Normal human beings are born with eyes, ears and the equipment behind them to process the signals those organs receive, and they acquire quickly the knowledge needed to understand the signals. But normal humans are not born knowing, and do not quickly learn, how to manage a large construction project or diagnose a disease; that takes expertise, learned over a long period. Other scientists find this distinction pedantic, and a little linguistic chauvinism has even emerged. The term "knowledge engineering" finds favor with the Japanese, because engineers have high status in Japan, but engineers don't enjoy such glory in the UK, which favors "expert systems." So it goes.

Expert systems operate particularly well where the thinking is mostly reasoning, not calculating — and that means most of the world's work. Even though a lot of professional work seems to be expressed in mathematical formulas, in fact, except in mathematically based sciences, the difficult choices are symbolic, inferential and rooted in experiential knowledge. Human experts have acquired their expertise not only from explicit knowledge found in textbooks and lectures, but also from experience: by doing things again and again, failing, succeeding, wasting time and effort, then learning to save them, getting a feel for a problem, learning when to go by the book and when to break the rules. They therefore build up a repertory of working rules of thumb, or "heuristics," which, combined with book knowledge, make them experts.

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newspapers said about merchant shipping traffic and so forth. Reasoning with all that knowledge is much more important than trying to dig a little bit of signal out of a lot of noise.

In tests performed by defense scientists, the Hasp/Siap program performed at levels equal to and sometimes exceeding human performance. The designers estimated that by "doing it smart," reasoning from knowledge, a saving of a factor of 100 to 1,000 was possible in the amount of computing needed. That translates into a big saving in defense dollars. Similar savings by "doing it smart" were evident in the Dendral project. Because the Dendral program knew so much about chemistry and the methods of mass spectrometry, and because it was so systematic in its reasoning, it could solve chemical structure problems using low-resolution spectral data that chemists could solve handily at that time only by using high-resolution instruments. Inexpensive low-resolution instrumentation plus knowledge-based reasoning equaled the performance of expensive high-resolution instruments.

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Intellectuals And the New Generation

Since the fifth generation — the mass production of intelligent machines — is comparable in human intellectual history to the invention of the printing press, with the certainty of making even greater changes in the life of the mind than books did, we might expect that American intellectuals (in particular those who still talk so reverently about the values of a liberal education, the sharing of the common culture and so on) are eager to mold this new technology to serve the best human ends it possibly can.

Unfortunately, they are not. Most of them haven't the faintest idea what's happening. If they notice at all, they see the computerization of university campuses, say, as the new barbarism.

"Out Fascination With Electronic Technology Is Myopic — and Quintessentially American" is the title of a recent essay in *The Chronicle of Higher Education*, a trade paper for academics. Its author, a professor of English, rushes to establish his bona fides: "I'm no 20th-century Luddite, rioting against machinery because it threatens an older world of handicrafts. Is it Luddism to believe that extreme love of machinery is unhealthy? That a society with an adolescent lust for its own technology is decadent?" Not Luddism, we'd say, just a misapprehension of the revolution, a confusion of means and ends.

To the computing illiterate, computer users' hunger for intellectual power and expansion looks like lust for gadgetry. In part, it is. So what? Who holds against us that we collect beautiful books with fine bindings and carefully chosen typefaces at the same time we honor what those books contain? What's wrong with admiring a beautifully designed computer or a clever piece of code, human artifacts both? But the main eagerness that propels youngsters to

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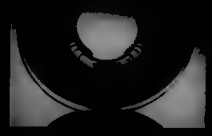

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the computer is the same eagerness that propelled earlier generations to literacy in the word.

We can further fault our English professor for not even stirring to discover that the "quintessentially American fascination" is taking place all over the world, in many nations in a more orderly and rational fashion; but at least he has let the matter come to his attention. Most self-styled intellectuals don't even recognize what's happening.

The novelist Hortense Calisher, deep in the middle of a long novel about the space shuttle, wrote an essay about the sublime ignorance and complete lack of interest intellectuals demonstrate in the face of another great human adventure, space exploration. "Among intellectuals who eagerly suffered talk of post-Einstein physics, space exploration as it might touch us humanly was dime store stuff and bad form. (Ditto among the literati.) As for politics, just try deflecting the Middle East worry with the query, 'What do you think of the chances, good or bad, of the U.N. Committee on the Peaceful Uses of Outer Space?' Most I met had never heard of it. Until then, neither had I."

What *are* American intellectuals thinking about, then? A fair question, and not so easy to answer. For one thing, politics, that most evanescent of interests. For another, art, which no one would quarrel with. Perhaps they even ponder their own irrelevance.

Intelligent machines open up a world of possibility, speculation and intellectual enrichment that could be — and for our children will be — the intellectual's instrument par excellence, a means of testing hypotheses, examining theories, playing "what-if" games and reshaping human thought at a level of complexity that no other intellectual tool — certainly not the written word, not any form of graphics we use now or mathematics — has ever been able to provide. The extension of human intellect that the fifth generation will give us is simply staggering.

Knowledge information processing systems allow, almost insist upon, the fusion of many different technologies and human services, from communications technology to health care delivery. The same principle is equally valid and probably even more important in the realm of ideas. Intellectuals and professionals in highly disparate fields often study the same concept to try to understand and use it; but because they have no common language, they cannot help or provide one another with insights they have acquired in their separate ways.

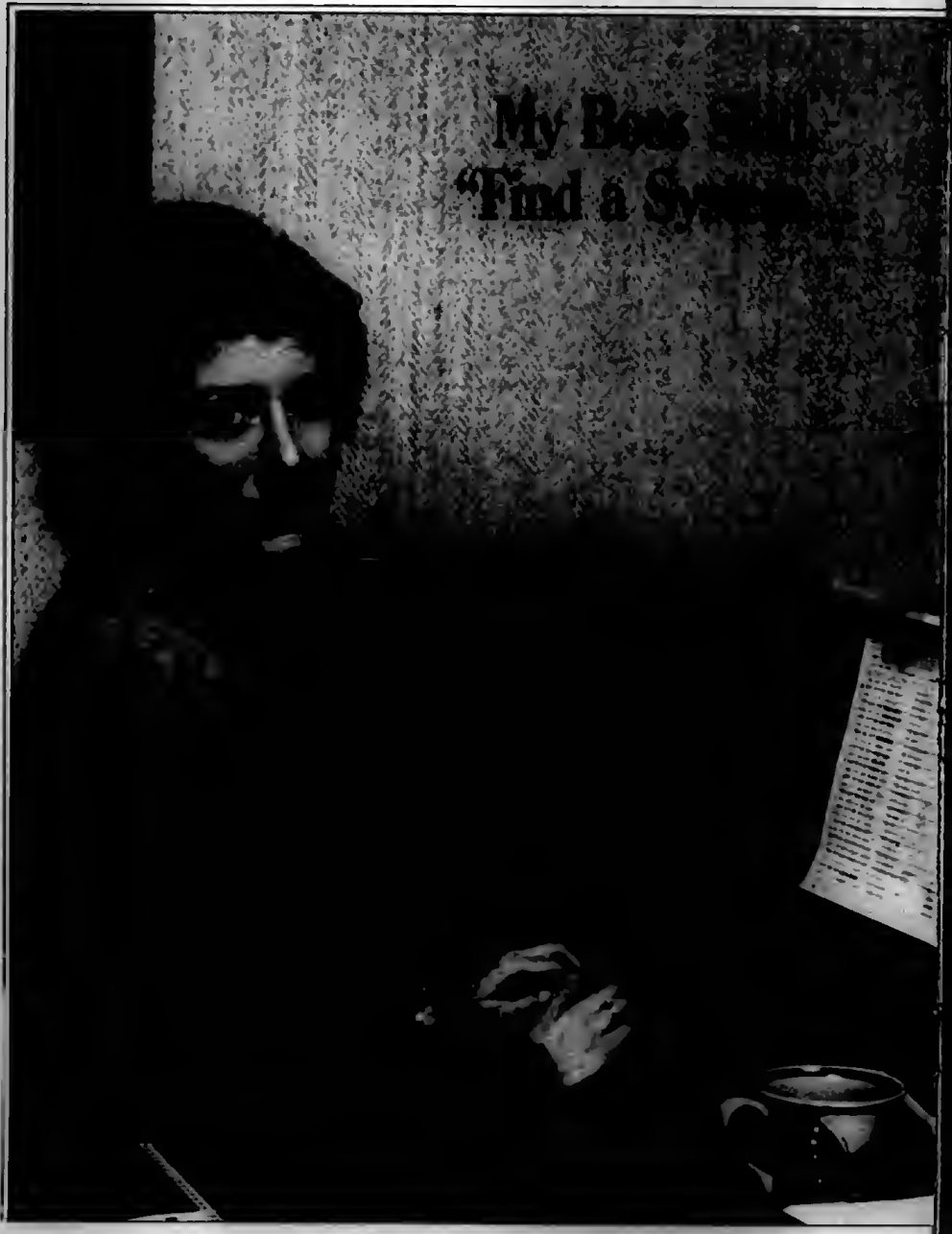
For example, both professors of English and knowledge engineers think very hard — and very practically — about the representation of ideas in language, but virtually no professors of English know anything about the discoveries knowledge engineers have made in their efforts to represent ideas in language, which will then be transformed into representations in a computer.

In short, no plausible claim to intellectuality can possibly be made in the near future without an intimate dependence upon this new instrument. Those intellectuals who persist in their indifference, not to say snobbery, will find themselves stranded in a quaint museum of the intellect, forced to live petulantly, and rather irrelevantly, on the charity of those who understand the real dimensions of the revolution and can deal with the new world it will bring about.

Artificial Intelligence And the National Defense

The U.S. has never felt very comfortable as a nation undertaking a large project merely for the common good of the people. We have managed, however, to spend a lot of money on useful (and not so useful) things as long as we could persuade ourselves it was in the national defense.

Artificial intelligence is foremost among these. When no corporation or foundation chose to take AI seriously, or could afford to, the Advanced Research Projects Agency (Arpa) of the Department of Defense supported it through two decades of absolutely vital but highly risky research. Since the Pentagon is often perceived as the national villain, it



is a pleasure to report that in one enlightened corner of it, human beings were betting taxpayers' money on projects that would have major benefits for the whole human race.

In the late 1970s, as some parts of the technology were ready to move beyond research and into development, venture capitalists and industrialists flocked to AI technical meetings and either adapted the technology to their own needs or set up firms especially to do AI. But the early cultivation had been supported by Arpa, which deserves credit for its enlightened scientific leadership.

'No matter how loyal an ally Japan is, it will be simply unacceptable for the U.S. to have to depend on Japan for a vital defense technology.'

Artificial intelligence has gone out into the world, for better or for worse, for commerce or for defense. The Japanese plan to rear this infant to full commercial adulthood. *We believe that Americans should mount a large-scale concentrated project of our own; that not only is it in the national interest to do so, but it is essential to the national defense.*

The so-called smart weapons of 1982, for all their sophisticated modern electronics, are really just extremely complex wind-up toys compared with the weapons systems that will be possible in a decade if intelligent information processing systems are applied to the defense problems of the 1990s.

In the summer of 1981, Feigenbaum was asked to give scientific testimony on the current state of research and development in AI and expert systems to a panel of the Defense Science Board, the highest-level scientific group that advises the U.S. Department of Defense. The panel's charter was to assess the possible impact of a large number of current technologies (it is rumored that they examined 70 to 80) on the defense of the U.S. In the report of the panel, AI ranked seventh using an opportunity-vs.-risk measure, and second using only an opportunity measure!

Accordingly, it is not surprising that the undersecretary of defense for research and engineering, Richard D. DeLauer, the "R&D chief" of the Pentagon, is quoted as saying, "The Defense Department should press this technology because no one else is pursuing it, and the Japanese have strong programs in both artificial intelligence and fifth-generation computers with a consortium of government, university and industry development."

We agree with DeLauer's assessment and would like to support it with five points.

The first looks with awe at the peculiar nature of modern electronic warfare that allows a marginal technological edge (a "shade of gray," in military technology) to be converted by the happy (*not* lucky) holders of that edge into a military result of total dominance ("black and white"). In preparation for the confrontation with Syrian MiG jets by their American-made jet fighters in the 1982 Lebanese war, the Israelis had improved the electronic systems of their planes, which otherwise were more or less the equals of the Russian-made fighters. They improved their electronic countermeasures and, most important, they invented and developed a remarkable plan for "reading" Syrian electronic emissions and commanding their electronic air battle on the basis of the "whats" and "wheres" that these signals revealed.

One result was that they completely confused the Syrian command-and-control system defending Syrian surface-to-air missile sites and succeeded in destroying most of those missiles. The major result, however, was the final score: 79-0 in airplanes destroyed. This amazing result was achieved largely by intelligent human electronic battle management. In the future, it can and

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IN DEPTH

will be done by computer.

Second, there is the question of access by the Department of Defense to the technology of the intelligent computer systems of the future. If the Defense Science Board's study is even approximately correct, we cannot afford to allow the AI technology to slip away to the Japanese or to anyone else. No matter how loyal an ally Japan is, it will be simply unacceptable for the U.S. to have to depend on Japan for a vital defense technology. And we cannot assume that our Japanese allies will automatically acquiesce to the imposition of export technology controls that we may deem vital to our defense interests. Japan, as a nation, has a longstanding casual attitude toward secrecy when it comes to technological matters. Except in the firms, Japan is regarded by its allies as a virtual sieve for Western technology to flow indiscriminately into others' hands.

The third point has to do with the skyrocketing costs of U.S. defense. While Congress debates huge appropriations for conventional weaponry, the issue of "smart bombs" takes on a new interest. In defense applications, the objective for any weaponry utilizing expert systems is *zero probability of error*, which means that individual targets will be sought out by sensing devices informed by intelligence data, eliminating the need for massive blanket bombing to achieve desired objectives. The economic impact of an intelligent armaments system that can strike targets with extreme precision should be apparent to even the most ardent national defense advocates — fewer weapons used selectively for maximum strike capability.

Fourth, it is essential that the newest technological developments be made available to the Defense Department. Technological leads are usually short-lived. We must retain the capability to accelerate the passage of technology from laboratory to military system under our control using our defense contractors. We cannot afford to be in the position of

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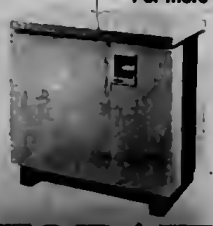

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waiting for the Japanese to push products through their development cycle to the commercial marketplace.

Finally, the Defense Department needs the ability to shape technology to conform to its needs in military systems. A Fujitsu or a Hitachi marches to a different drummer from a Rockwell or a Lockheed. Our defense industry must obtain and retain a strong position in the new advanced computer technologies.

Until recently, the U.S. has led the information revolution. Our semiconductor technology was recognized as the best, but no longer. The outcome of the great chip wars of the early 1980s is not final, but for many important hardware components, Japan is ahead. Japanese supercomputers are comparable to American ones. Japan is moving into other kinds of hardware and into software development. If we doubt that diligent nation's ability to do the same for machine intelligence by the end of 10 years, we need merely look back 10 years to see where Japan was in computing technology then. The simple answer is nowhere.

Aside from direct combat — which, if it is nuclear, makes everything discussed here irrelevant, we hasten to say — our industrial base is a vital part of our national defense. If industry continues to be run by old-fashioned methods using old-fashioned technology, it will be nothing but a costly white elephant to us.

There has been much talk about the reindustrialization of the U.S., and it is no doubt a good idea; but its success will rely on the large-scale integration of intelligence and knowledge technology into industrial processes.

Robert Kahn of Arpa's Information Processing Techniques Office sat and mused on this situation one sunny afternoon not long ago. "Yes," he said, "Arpa has acted as the conscience of information processing research in the U.S. We virtually had to thrust the Arpanet down the throats of the computer science community, and now they can't function effectively without it. In the past, things were different. So what if IBM was slow to introduce time-sharing and virtual memory? So what if it took AT&T 10 years to come around on packet switching? It didn't matter very much because time was on our side, the industry was strong and we could afford to wait.

"But it's not as strong now and the competition is much greater. Like General Motors, it's beset by competition it

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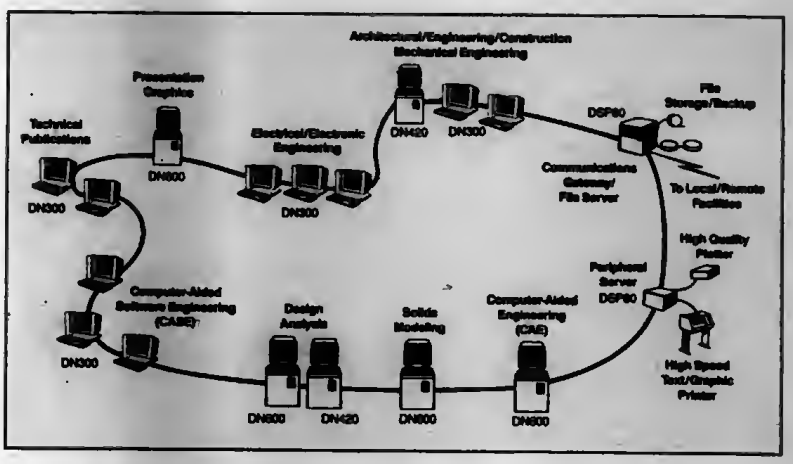

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Domain: The Next Generation

once dreamed would never exist. At the same time, markets are opening up it hadn't anticipated and is slowly learning how to serve. High tech isn't just for breakfast anymore. Yet nobody knows quite what to do or where to go; there's no place providing the necessary leadership or the catalysts to keep us competitive. In the past, the industries or the government could get together and set standards — that happened with the railroads and it happened in highways, it happened in radio and TV. But we can't do that very effectively with electronics and particularly software; changes are happening now or need to happen next Tuesday; and what's more, those changes are often invisible." Such problems are now well beyond the scope of one small government agency to solve, no matter how visionary it is.

'At the moment, we Americans are placing our economic and defense bets on wholly decentralized planning, cutthroat competition and a touching faith that the best will win because economic laws work that way.'

We calculate that in 1982, the aggregate spent in the U.S. on artificial intelligence research from all sources, governmental and private, was about $50 million. This sum just about equals the amount the Japanese government expects to spend on an average per year over the next 10 years for its fifth generation (not counting Japanese internal industrial AI support, which may double or triple the amount). If we continue as we have, we two nations will act as guinea pigs for an interesting experiment in planned, as opposed to unplanned, research.

At the moment, we Americans are placing our economic and defense bets on a method that has more or less worked for us in the past (though our current economic situation throws some doubt on its utility in a complex postindustrial world). That method, of course, is wholly decentralized planning, cutthroat competition and a touching faith that the best will win because economic laws work that way.

The Japanese part of the experiment is different. Although it parallels our notions of economic competition at the end of the process, it separates that part from the beginning of the process, the research and development of goods, in this case, knowledge technology. Research and development, the Japanese believe, require some central planning. Though individual pieces of research are to be contracted out to various laboratories, such research will be coordinated by workers at the Institute for New Generation Computer Technology in Tokyo. The Japanese believe that human intelligence is a precious resource that must be carefully deployed. Money is also precious and cannot be wasted.

We, on the contrary, are currently betting that uncoordinated development of the information processing industry is a luxury we can still afford. We are behaving as if we have talent to spare and can use it on projects important or frivolous, depending on who has cash to put up. We behave as if there's plenty of such cash. On these assumptions a critical part of our national defense depends.

Alternatives for America

The Japanese have announced that in 10 years they will produce knowledge information processors. Several options are open to Americans, but few of them offer truly palatable alternatives to undertaking our own version. Let us examine them.

1. We can maintain the status quo. We can continue doing a lot of short-term (shortsighted, in the view of many) research and development, spurred by nothing but immediate market considerations. We can penalize the farsighted by removing

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IN DEPTH

them from power, industrial or political, every time the bottom line fails to give us instant gratification. We can embrace antitrust as infallible revelation and litigate ourselves into national collapse. Uncoordinated planning, investments in the frivolous and lack of investment in the serious might still allow us to muddle through — somehow.

2. We can form industrial consortiums to meet the Japanese challenge and, as citizens, insist that the Justice Department take a reasonable stance regarding joint industrial R&D. This effort might take an act of Congress. Americans, however, have little experience with such joint ventures.

3. We could enter a major joint venture with the Japanese. Their fifth-generation proposal gives a lot of lip service to international cooperation. They might not have really meant it, but we could give their lip service a test. There is also the possibility that as the conclusions of various phases of the project approach, the Japanese might find themselves falling short of their targets — either technologically or financially — and would welcome American collaboration. The U.S. and Japan would complement each other, and the joint venture could be powerful internationally.

4. As a variation on the third plan, we know that the economic value of Kips (the so-called value added) is primarily in their software, or their knowledge, and we have a proven record as specialists in great software ideas. We could forget about producing the machines and produce only the software instead, styling ourselves after the razor blade company that gave away razors because profits were in the blades. Chips are cheap, and we've seen competition drive profits out of many segments of the computer hardware business. Let's make software instead. In software, capital investment can be low and profits huge.

5. We can form a national laboratory for the promotion of knowledge technology. It might be a mega-institute, like Los Alamos, embracing all forms of knowledge technology. Or it might be a smaller multiple-university-run laboratory (such as Brookhaven and Fermilab in physics). Or it might have one university as the prime contractor (like the Stanford Linear Accelerator Center).

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the national laboratory must be newly created. Institutions have a natural life cycle, being most energetic and creative when new and unbureaucratic. We cannot look at the existing national laboratories for the kind of innovations a knowledge technology laboratory must produce, freighted as they are with tradition, stodginess and bureaucracy.

6. We can prepare to become the first great agrarian postindustrial society. We are blessed with huge tracts of fertile, arable land. Progress in our agrosciences and in automation applied to agriculture has always been impressive. We absolutely shine in growing things. As General Motors and General Electric decline, we can organize General Agriculture to maintain our balance of trade.

Yet another alternative, a center for knowledge technology, is described on In Depth/4.

The Japanese understand perfectly that a superiority in knowledge technology provides whoever holds it with the power to resolve shades of gray into black and white — provides, in brief, an unequivocal advantage — whether we are speaking of personal power, national economics or warfare. They have already begun to translate that understanding into the new technology that will give them unequivocal advantage over the rest of the world, perhaps by the middle of the next decade.

Other nations recognize the soundness of the Japanese strategy. In response to the farsighted Japanese, ambitious national plans are being drawn up in many places. But the U.S., which ought to lead in such plans, trails along in disarrayed and diffuse indecision.

We have resisted calling this a crisis for the U.S. We could pursue a dark thought, imagining artificial intelligence technology to slip away out of our control, which would ultimately have severe effects on our industry, standard of living and national defense.

We prefer instead to regard this Japanese challenge as an opportunity for the U.S. to revitalize itself, to join the Japanese and other nations in the world in the exhilarating adventure of moving the Empire of Reason, as historian Henry Steele Commager could once, with justification, call the U.S., decisively into the Age of Reasoning Machines.

About the Authors

Edward A. Feigenbaum, professor of computer science at Stanford University, is one of the originators of the concept of knowledge-based systems — computers that use stored knowledge to make decisions that would normally be made by human experts. Feigenbaum has edited and coauthored several books, most recently The Handbook of Artificial Intelligence.

Pamela McCorduck is a New York-based writer who contributes articles on scientific topics to both specialized and popular magazines and teaches a workshop at Columbia University in writing about science. Her most recent book is a history of artificial intelligence, Machines Who Think.†

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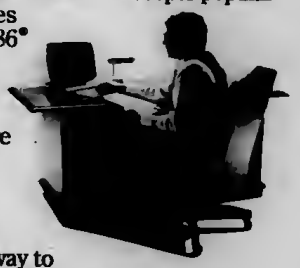

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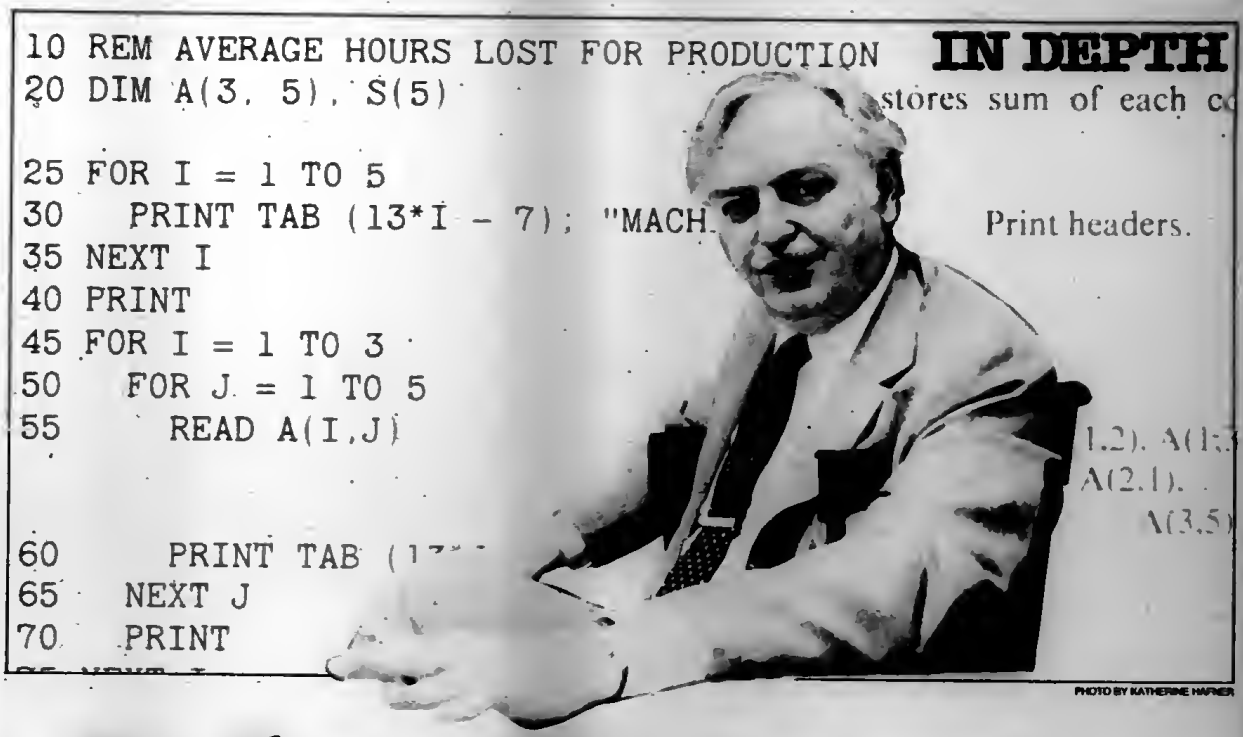

PHOTO BY KATHERINE HAFNER

John Kemeny

An Interview With The Originator of Basic

By Katherine Hafner

When John G. Kemeny logged onto his terminal on the first day of the month, three words greeted him: "Happy 19th Anniversary."

The message came from two computer operators who knew Kemeny would understand. Naturally, he did.

At 4 a.m. on May 1, 1964, the first time-sharing system went on-line concurrently with a new computer language called Basic. Both Basic and the time-sharing system were developed by two Dartmouth College mathematicians whose curiosity was stirred by the arrival of computers in their field.

Basic, of course, has evolved into one of the most widely used computer languages. And the Dartmouth time-sharing system redefined computers as universally accessible tools.

Leading the research on Basic was a Hungarian-horn mathematics professor named John Kemeny.

As a teenager in 1940, Kemeny fled to the U.S. to escape the Nazi tide in Europe. He received his Ph.D. in 1949 from Princeton University, where he worked as a research assistant to Albert Einstein.

In 1953 Kemeny moved to Hanover, N.H., to teach at Dartmouth. In 1981 he resigned after 11 years as president of the small Ivy League school. The indefatigable Kemeny will remain a fixture on campus as a professor of mathematics, spending his days immersed in his first true love: teaching.

The American Federation of Information Processing Societies, Inc. is giving Kemeny its first education award at this week's National Computer Conference in Anaheim, Calif. The honor recognizes his "visionary efforts at making computing universal for students of all disciplines."

To the general public, Kemeny is perhaps best known for heading the Kemeny Commission, which investigated the 1979 accident at Three Mile Island.

Kemeny was interviewed earlier this month in his office tucked away in a corner of the college's Baker Library.

How did the development of the Basic language start?

Tom Kurtz [professor of mathematics at Dartmouth and co-developer of Basic] started the chain of events. He came to me in early 1963 and said, "Don't you think the time has come for liberal arts students to learn how to use a computer?" I said something like, "Yes, Tom, but I don't think it's physically possible." Then he said he had an idea on how to do it and he outlined what would become time-sharing. I was very quickly sold on it.

Wasn't Dartmouth's time-sharing system the first?

IN DEPTH

MIT started theirs before we did and finished about a year after we did. I usually tell people that's because they hired professionals and we hired undergraduates, so we finished first.

Basic was my idea. I said, look, as long as we're doing this, how about coming up with a language that would be a lot friendlier than the Fortran of those days, which was essentially all that was available. And that's a very different Fortran from today's Fortran because Basic has had a very big influence on Fortran. But there Tom was skeptical. He said, "That would be terrific, but what would be the use of our students learning a language that they couldn't use anywhere except at Dartmouth?"

He was convinced that IBM would dictate what language was used. And I had some worries about that, too, but I persuaded him it was worth doing anyway.

And that's how Basic came about.

How long did it take?

We operated on a very tight timetable. We started planning in the Spring of '63 with a National Science Foundation grant. The hard work all took place in 12 months; that included developing time-sharing and Basic and I myself wrote the first Basic compiler. The computer did not arrive until halfway through the year, so we had to beg borrowed time from other computers. But within 12 months we had both time-sharing and Basic working.

What was the reaction when it first came out?

The students just took to it like ducks to water. With my colleagues, (acceptance) was slower. A great many of them had to learn in self-defense, first in science courses, but later in other courses. They just couldn't let the students get that far ahead of them. Of course, that's an incredible amount of power to put at a student's fingertips. As far as the general success, it went way beyond anything we expected.

We had to develop it on GE machines. We had no connection to GE, but they had the right combination of equipment and one of the senior vice-presidents came up just to see what the heck we were doing. He thought it had real potential for GE, so they gave us a large machine, much larger than anything we could afford, in exchange for developing a large time-sharing system. Of course, GE sold out some years later to Honeywell, so our equipment is now Honeywell. One interesting thing is that when they sold that equipment, one thing they held onto was time-sharing services. It's a good example of cooperation between industry and education. We both gained greatly.

With the many different versions of Basic that exist today, do you see standardization as hopeless?

No. It's going to be hard, but something very important has just happened. A national committee to standardize Basic has been at work for about seven years. It's a broadly representative committee, not just educational institutions. Part of the problem is that too many people have a stake in Basic. I think it's the language, for example, that's run the most on personal computers. So there are all kinds of financial stakes. But the committee should issue its report this spring, so I hope by the end of the year there will be a standardization.

Do you think the variation hurts the language?

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Terribly. I think that's the biggest problem Basic has at the moment. There are actually two kinds of problems: One is that it's not standardized. The other one is that some of these implementations, particularly on micros, are very poor implementations, and that hurts because people think the Basic they're using is *the* Basic. I keep hearing people complain that you can't do so and so in Basic, when we have had it for a decade at Dartmouth and other places.

'Still, in government and business the overwhelming emphasis is on efficiency, and they do not understand that for very little extra money they could come up with much friendlier systems.'

Also, since that's the language most people know, it's an obvious language in which to have teaching materials available, but it's terribly hard to do that because if you're writing on one computer, it won't run on another. I hope that's what standardization will achieve.

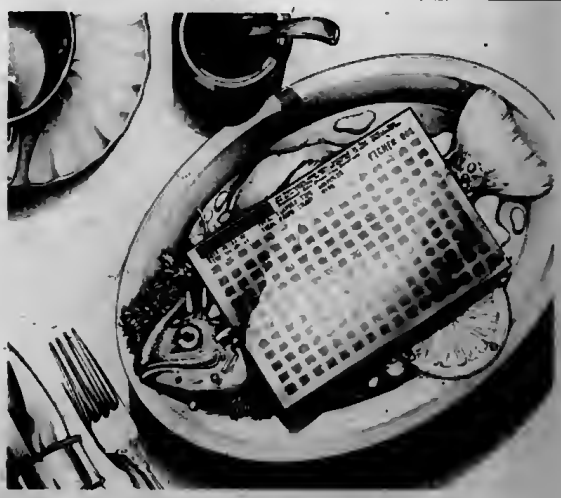
Did you foresee the pervasiveness of computers today?

Yes. At the dedication of our Kiewit Computation Center in 1966, I gave a speech that probably shook my audience more than any other I ever gave. I made a prediction that in 25 years, computers would be as common in the home as television sets were in 1966. I think a significant portion of the audience thought I was mad and, of course, with eight more years to go, I can easily make that prediction. Actually, I will be partly wrong because I only predicted that computer terminals would be that common in the home. I did not foresee the coming of personal computers.

In your 1972 book, Man and the Computer, you wrote that you would like to see a fundamental change in the attitude of business and government towards people and their relationship with computers. You said: "Both should be willing to spend more to make life better and easier for everyone." Has your hope materialized or is it more remote than ever?

I think some of both would be the answer, in that the coming of personal computers in a way has made it a great deal easier for people to have reasonably friendly access to computers. I still have no evidence that either business or the government has changed its attitude in any fundamental way. Still, in government and business the overwhelming emphasis is on efficiency and they do not understand that for very little extra money they could come up with much friendlier systems.

How could they make systems friendlier?



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By spending a little more money on the user interface and worrying less about whether they waste a little bit of computing time, let the computer do more of the work so human beings have to do less. Particularly, computing power has gotten to be so cheap that some of the early attitudes — all of us had them — of having to do things so terribly efficiently are not applicable.

You said in 1976 that as computer science develops, less and less advantage of the talents of human beings is being taken.

Do you still believe this is true?

Let me say that I at least don't see evidence that computer scientists deal with the problem as to what the division should be between human beings and computers. It is perfectly natural that computer scientists should figure out how computers can do more and more, but I think the problem of the right division of labor between humans and machines has not been addressed, at least not to my satisfaction.

How would it be addressed to your satisfaction?

By looking very hard at categories of tasks and trying to figure out either by thinking or by experimenting just what computers are good at and what human beings are good at. That has not been done to my satisfaction; I mean, I would think that it's a subject that you could write lots of papers on. I see articles on all sorts of things, but not on that. You see papers on how you could build a bit more creativity into your computer program but not a paper on how can human beings working together with a computer achieve more than either one of them could alone.

What's your assessment of CAI [computer-aided instruction] today?

I was never in favor of CAI. In fact, I vocally opposed it in the '60s, when some computer manufacturers came out and predicted that CAI would take over education completely. I don't believe computers will replace teachers. Also, some of the early CAI and some of the CAI today is terribly drab, so I tend to avoid the word, though there are some things that are technically CAI that I wouldn't quarrel with. If you want to drill a student in foreign language, vocabulary or grammar, a CAI program is fine. That's a routine drill. I think that's what CAI is good for. What I like to do is distinguish between that and the use of computers in education, which I am, of course, a very great believer in.

Suppose high school students have trouble with arithmetic in grade school. They often get hung up and they're afraid to tackle algebra; not to mention something as terrifying as trigonometry. In the age of computers, there's just no good reason for that at all. Let me take trigonometry; it's a good example. I try to think back on my trigonometry course in high school, and most of the time we spent in class was spent on

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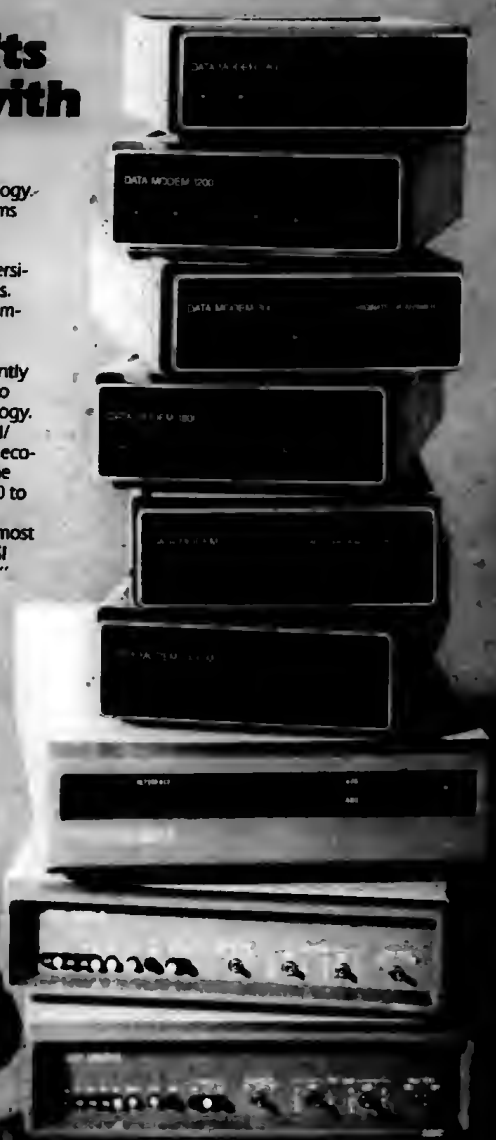

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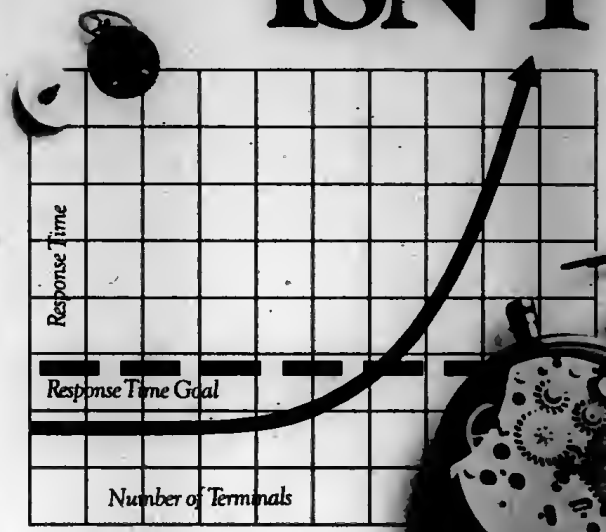

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IN DEPTH

stuff that there's no sense in teaching human beings in the age of computers. For example, the only way you could find the value of a sine was to look it up in a table and then interpolate. It's absolutely madness to teach interpolation from a table. It's a useless art.

On the other hand, trigonometry is as important as it ever was and with the help of a computer you can teach vastly more. Here's where personal computers will help a great deal. I have tried to rethink what you can do with personal computers, because I think it's a very important topic. For example, one thing they have is very good graphics. There are all kinds of things a student can do sitting at the screen; they can see what the picture of the sine of 2x looks like as compared to the sine of x or whatever and they can play around and discover visually in a few minutes something that would otherwise be very abstract to them.

The single most important use of computers is, I believe, to use the program as the teaching tool. Understanding one program is much more important than understanding how it works. Even those of us who have taught math for years learn something about it when we first write the program.

How do you view the rush among college students today into computer science. Where does this leave liberal arts?

Let me differentiate between computer literacy and computer science. Tom Kurtz convinced me 20 years ago that it's absolutely essential for every liberal arts student to acquire computer literacy and today I would set a higher standard for computer literacy. The student should know what the computer does and should have written a number of programs so that they're not afraid to use a computer.

I feel differently about computer science. Computer science is one of 30 or so subjects taught in a liberal arts college as something you can specialize in. At the moment, with the way the job market is, probably too many students are rushing into it. Except for those who really want to devote their whole life to it, I would prefer that they major in something else and then take a substantial

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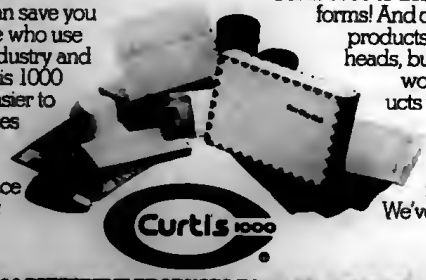

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amount of computer science.

With the pervasiveness of microcomputers and the availability of less expensive application packages, what do you see as the future for time-sharing?

I think the best of all possible worlds has not yet happened. It's obviously going to change the nature of time-sharing. The best of all possible solutions is to have lots of personal computers, but have them all tied into a time-sharing system. With personal computers, the power is there, and you can do a lot on your own, but what you're losing without time-sharing is the sharing of information, even the sharing of knowledge.

Take one of the earliest good applications of time-sharing: airline reservations. It seems that's likely to change with more personal computers at airports, and therefore some of the work will be done locally, but it's totally useless unless they're still tied into a time-sharing system. The division of work is going to shift. Instead of a terminal you have a personal computer with all sorts of things you can do locally; on the other hand, for example, they could transmit to the personal computer all the reservations you have for that day so you don't have to tap into wherever the main computer is, but periodically there has to be an exchange of information between the personal computer and the central computer.

What role did computers play in the Three Mile Island Accident?

The absence of computers played a role in the accident itself. I was horrified when we toured the plant and they took us into the control room, which is where all the problems happened. I'm afraid after 15 minutes, a reporter overheard me saying, "My God, this is 20 years out of date." I got terribly nasty letters from authorities asking how I could say a thing like that.

It turned out I was wrong. We later found a document written 10 years earlier by a high official of the Nuclear Regulatory Commission. In it he said the equipment was 20 years out of date. So I was wrong; it was 30 years out of date.

What it amounts to is that computers were essentially not used. The only real computer was an ancient little computer that was purely for logging. We really decided that some good inexpensive computers would have made all the difference.

Now that you nearly have one 25-year prediction behind you, what do you see for the next 25 years?

Let me stick my neck out and say I think the breakthroughs will not be in computers. Of course, they'll get smaller and cheaper, but in a way the biggest changes have already occurred. With ordinary computers, there's only so far you can go in size because you run into the speed-of-light limitation. The breakthroughs still to happen are in thinking up really good uses of computers. Applications have lagged way behind the abilities of computers. There's a large supply of mediocre programmers, there are very few good systems designers and very few really first-rate software systems. It is ridiculous that with the number of professional programmers who work for all kinds of computer companies, amateurs still seem to come up with software none of them have thought about. You read a story every month about someone making millions with some incredible software; they deserve it.

The interviewer, Katherine Hafner, is a Computerworld *staff writer.*

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A Policy Statement For Managing Microcomputers

By Peter G.W. Keen

How can organizations achieve the productivity benefits of microcomputers without threatening the integrity of the corporate data resource or creating duplication, inefficiency and waste?

The generic policy statement presented here balances local autonomy and central integration in managing micros in the workplace. The statement can be applied generally even though each company works according to specific constraints and needs.

The word "control" does not appear. The moment centralized DP publishes anything about controlling micros, users substitute the word "preventing." They see "controlling" as yet another plan by DP to protect its traditional territory.

Nevertheless, there must be a policy. Too often authority and accountability in the overall application of

PHOTO BY KATHLEEN GOW

information technology are no more than implicit in the areas of microcomputers, office automation, development priorities and distributed processing.

Policy basically involves defining mandates and directives: *who* decides, rather than *what* is to be decided, and who has responsibility.

The Policy Statement

1. The general philosophy is to encourage cost-effective applications of microcomputers; allow end users every opportunity to acquire hardware and software; and coordinate the recommended software and hardware with education, consulting support and sharing of experience and applications.

It is also essential to establish procedures for acquiring micro tools and to assign clear responsibility for auditability, security and, where relevant, maintenance.

2. Each major business and/or DP unit will appoint a coordinator for micros. The coordinator must have some prior (but it need be only limited) experience with micros as a user or builder of systems.

3. The coordinator will identify up to three recommended hardware configurations. These may be from different vendors, but each machine chosen must have communications capability so that it can be used as an intelligent terminal and access data from the company's mainframes. The coordinator must ensure that maintenance and technical support will be easily available to all user locations and should also set up, where possible, arrangements for quantity discounts, maintenance, leases or anything else that can reduce the cost to the company without increasing risk or decreasing benefits.

4. The coordinator will prepare a list of recommended software, which must be proven and reliable, require minimal technical support, be easy to learn and use and offer clear productivity opportunities for the company's business units.

The recommended software list will define a software spectrum, including low-end and advanced packages. The spectrum provides users with options for a given type of application. (The box on In Depth/39 shows a sample software spectrum for the Apple II.)

The coordinator must become thoroughly familiar with the software on the list and be ready to answer users' questions about it.

5. Users who wish to acquire software and hardware must register their requests with the coordinator. Each request should indicate the expected applications and identify potential benefits. These should be discussed with managers in the user department. Users are asked to quantify the economic value of the benefits even if they can provide only subjective estimates. The purpose here is to ensure that both costs and benefits are reasonably thought through. However, no formal return on investment, payback or cost/benefit analysis is required.

Users are urged to:

- Select hardware from the recommended list: The coordinator will provide assistance in locating supplies and resolving any maintenance problems only for hardware on the list.
- Select software from the soft-

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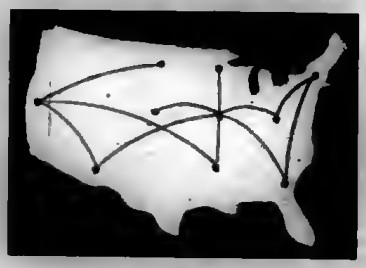

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A MICRO POLICY

IN DEPTH

ware spectrum. The coordinator will provide training material and limited consulting advice for these.

- Have the coordinator evaluate packages not on the recommend list.
- Avoid programming. The policy is to use end-user packages and languages. Users are totally responsible for maintaining any applications they develop. Under no circumstances will resources be diverted from DP to deal with programming problems, errors or maintenance.

'The micro is here to stay. No rearguard action by DP can or should obstruct the first real contribution of computer technology to the everyday demands of managers, professionals and staff.'

Users are reminded that software engineering can be difficult, risky and expensive. It requires professional expertise.

The frequent turnover of qualified technical staff may leave them with a substantial maintenance problem.

6. **Users are responsible** for obtaining approval for acquisitions from their own management. The coordinator has no authority to reject any request.

7. **Further user responsibilities** include the following:

- Compliance with all legal and audit requirements.
- Security of hardware, software and data.
- Data integrity. No user application may update a data base created or stored on a remote machine. If such a capability is justified, it must be provided by a centralized organization such as DP.
- Report integrity. Any report generated by an end-user package must be clearly identified with the label "Micro Report" so that it is not mistaken for an official report generated as part of the company'a formal management information services (MIS) function. In situations where a micro report has basically the same format as an MIS report, the user must make sure the two cannot be confused.
- Ethics. Piracy is a growing problem for software vendors. Users are responsible for ensuring that the spirit and letter of the laws of copyright and trademark protection are followed to protect both the individual and the corporation.

8. **The coordinator functions as a "gatekeeper"** responsible for:

- Assisting users in the following areas of acquisition and application (only for hardware and software on the recommended list): purchasing, maintenance and troubleshooting; basic training for users and builders.
- Identifying and evaluating new software and hardware and adding items to the recommended lists.
- Identifying completed applications that may be of value to other users. A major part of the coordinator's role is to disseminate informa-

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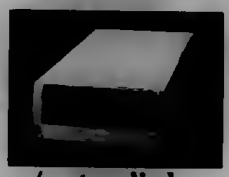

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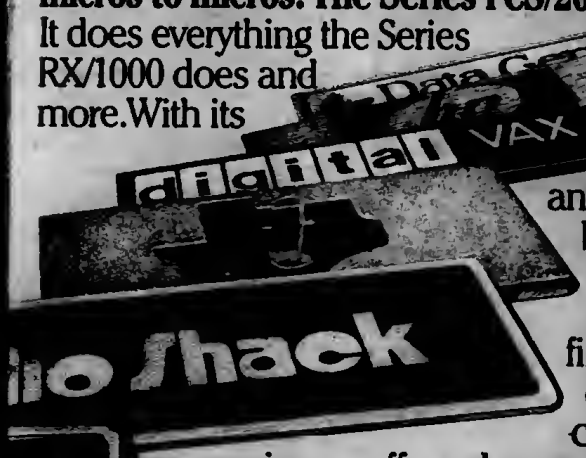

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Basic Rationale

This policy statement should answer most questions from users, DP, senior managers and skeptical bystanders. The core issue is incentives. The micro is here to stay. No rearguard action by DP can or should obstruct the first real contribution of computer technology to the everyday demands of managers, professionals and staff.

DP needs incentives to respond to the accelerating interest in exploiting micros as a low-risk, high-yield investment in productivity.

Users need incentives to cooperate with DP, which is, in effect, the guardian of the computer information resource. Up to now, that resource has mainly been an aggregation of transaction processing, ill-structured files and inaccessible machines. DP is rapidly creating flexible capability in which terminals provide access via data communications to a range of services and products.

DP is also building an integrated delivery vehicle and information base that is more and more relevant to all levels and functions of the business. If users fiddle around, diverting funds and efforts and spreading incompatible machines, undocumented systems and inconsistent and redundant data bases, DP will at some point have to pick up the pieces.

Why a Coordinator?

The need for a coordinating role is clear. The software and hardware markets are changing rapidly and the current channels of distribution are poorly suited to meeting the needs of corporations. Retail computer stores focus on the consumer and their staffs generally have limited understanding of the product.

One salesman in a store specializing in sales to small businesses was asked, "How do you demonstrate software?"

"We really don't," he answered. "We let the machine do the selling."

Retail stores focus their effort on the low end of the market. There is an immense gap at the moment between corporate demands and retail supply channels. It is hard for companies to locate good software. Some central gatekeeper in the organization is essential to act as a focal point, a purchasing agent and a researcher.

The policy statement requires the coordinator to select up to three recommended machines, each capable of communications. Companies must find a mid-point between the two unattractive extremes of allowing incompatible machines to proliferate and trying to impose a simple machine standard on users. A likely selection of machines will be:

- The Apple Computer, Inc. Apple II or Radio Shack TRS-80 for their supply of end-user software and because they have strong loyalty among professionals and software developers.
- A Digital Research, Inc. CP/M-based machine, since this is now the *de facto* software atandard.
- A personal computer manufactured by a mainframe vendor (for example, the IBM Personal Computer or the Digital Equipment Corp. Professional). The IBM Personal Computer will surely become a Systems Network Architecture terminal and thus an integral component of many companies' distributed processing capability.

few, since several vendors have recently launched attractive new products and other 16-bit micros will appear within a few months. On the other hand, companies must tackle the issue of proliferation now.

A key requirement in the policy statement is for communications capability. This need is based on the widely held assumption that the world ia converging on the multifunction workstation and that the stand-alone micro is just one starting point; by augmenting it with communications, it becomes an intelligent terminal. In that situation, the needs of both end users and DP are satisfied. The distributed micro can be used in stand-alone mode with zero operating cost, in communications mode for access to a data re-

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source and in intelligent-terminal mode as a workstation in a distributed system.

Development Strategy

The software spectrum is the base for a development strategy. Micros are, above all, an end-user concept. It makes absolutely no sense to encourage the growth of amateur DP shops or to divert resources from DP. There is room for small ad hoc (Basic) programs, but the main aim should be to provide a range of first-rate nonprocedural tools with which people who know the application area well can develop systems both small and large.

By providing low-end and advanced tools, the coordinator can give every incentive for end users to move in this direction. He is saying, in effect: "Look, if you want a quick, simple project analysis system, have your secretary spend an hour a week typing in figures and use Visicalc. Later on, you may want to use DSS/F, which is much more powerful."

Or, he might advise: "You can do this with Visicalc, but it's very likely you'll want to create some more complex reports. Try DSS/A."

It is absolutely vital that whatever software the coordinator adds to the recommended list be proven. That list is in itself a safeguard against users getting into trouble and needing expert help, having to abandon projects or finding it difficult to maintain the systems they develop. Instead of trying to control the users, the policy statement aims at steering them toward first-rate, low-risk, reliable, cost-effective tools.

The coordinator's distinctive contribution to the organization — the effective use of advanced tools — lies in the development of the software spectrum. Being explicitly responsible for providing basic support (answering reasonable questions) for the software on the recommended list gives him plenty of incentive to evaluate potential additions thoroughly.

The most contentious aspect of the policy statement is the acquisition request. This point puts authority solidly with the user and leaves the coordinators (and DP) with no veto. The requirement that users be responsible for auditability, maintenance, security, data integrity, report integrity and ethics provides necessary bounds on user freedom. The business justification is really an issue for user management. By requiring users to obtain their own budget instead of being funded centrally the issue of benefit analysis and accountability for results is placed firmly where it belongs — with the user.

About the Author

Peter G.W. Keen is chairman of Micro Mainframe, Inc. in Cambridge, Mass. He is coauthor, with Michael Scott Morton, of Decision Support Systems: An Organizational Perspective.

Keen acts as managing editor for two publications — "International Journal of the Human Side of Office Technology" and "Office: Technology and People." He will be keynote speaker at the Microcomputers and Organizational Productivity conference sponsored June 7-8 in Boston by Micro Mainframe.

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Software

. . . a handmade commodity designed in an ad hoc manner with few standards, a product that is almost always late, poorly documented and difficult to maintain.

The Maintenance Challenge

By Paul Bassett and Scott Rankine

Maintenance holds the software industry captive, strangling productivity and tying up vital programming resources. Programmers and analysts spend far more time adapting and maintaining programs than they do writing them. Maintenance accounts for a dizzying 50% to 70% of total software expenditures. While hardware costs have plummeted, the cost of producing programs has skyrocketed, ranging up to and beyond $200 per line of finished code.

In spite of their "gold plating," many commercial applications contain embarrassing and occasionally crippling errors. This situation occurs largely because software remains a handmade commodity designed in an ad hoc manner with few standards, a product that is almost always late, poorly documented and difficult to maintain.

Maintenance covers an enormous range of activities, including corrections to code, repairing design flaws, modifying documentation and test data, upgrading capabilities and user support.

Many activities labeled maintenance are actually enhancements. In the strictest sense, maintenance means to restore something to its original condition. Unlike machinery, however, software does not wear out.

Enhancing software is necessary for a variety of reasons, including changing user needs, environments, operating systems and procedures. Maintenance is also an inexact science. Debugging an operational program can never reveal the absence of errors, only their presence. As a result, putting the final polish on a program and

IN DEPTH

ensuring that it is relatively error-free is the most time-consuming phase of the development cycle.

Life-cycle maintenance costs are high, often exceeding the development or purchase costs of the application itself. This fact tends to be glossed over by software vendors, who often choose to ignore the high costs of supporting applications in order not to scare off prospects.

Generally speaking, most programmers regard maintenance as low-level drudgery. Having developed an application, many DP professionals spend years locked into maintaining it. Boredom eventually sets in, contributing to employee turnover with the subsequent loss of vital expertise crucial to maintaining the application.

Slow Death

Ironically, software "ages" and eventually "dies" from the cumulative effect of maintenance activities. Over time, the structure or integrity of a program, controls, test data and documentation degenerates as a result of mostly minor and unconnected changes.

Minor modifications first appeared cost-effective because they required less effort to perform than a major system overhaul. But in the end, repeated surgery causes the application to bleed slowly to death. It eventually takes more effort to maintain the application than to rewrite it, and the old system is laid to rest.

However, it is not the nature of software that is to blame, but current programming practices and the tools that support them. A brief analysis illustrates this point.

Current Methodologies

In the commercial software environment, there is often considerable functional overlap between programs. File maintenance is a good example. Among file maintenance programs, it is mostly the names of the files and the fields to be maintained that vary. The logic of opening a file, reading records, querying the user about what he wants to do, adding, changing and deleting records is quite common to such programs.

Programmers faced with the task of creating a new file maintenance program — or any other application, for that matter — usually begin by trying to reuse code segments from existing programs that in some respect satisfy their current needs.

Through a process of cutting and pasting, the old code is modified and then combined with the programmer's own custom code to produce a working program. Considering the effort that went into developing and debugging the old code, this process appears to give the programmer significant productivity leverage.

However, once the process is completed, both the old and new programs must be maintained as completely independent entities despite the considerable common functionality. After cutting and pasting, both old and new code are invisibly intertwined, making them difficult to modify because of other hidden and subtle interactions.

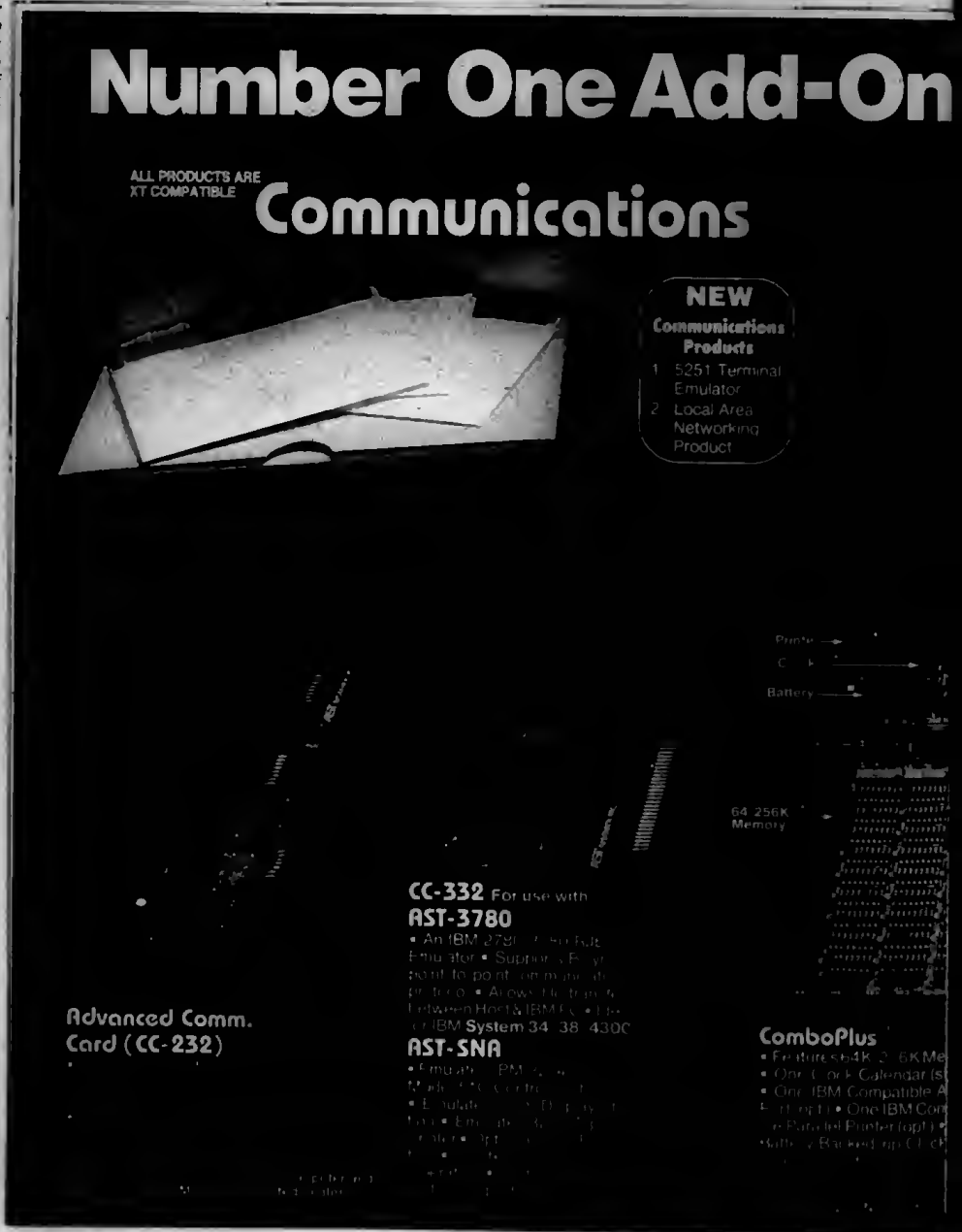
Bigger Headaches

Altering code that is common to several programs presents even greater maintenance headaches. Any changes, no matter how slight, must be manually introduced into each of the programs because there is no easy or automatic way of guaranteeing that the changes will interface with the different programs. Thus, the potential maintenance labor savings of common code is not realized.

Reusing and modifying old code in this manner is clearly haphazard and depends solely on a programmer's ability to judge what code segments can safely and effectively be reused in different contexts. An extremely slow and error-prone process, it is still perceived by many as more desirable than writing programs from scratch.

However, the programmer is faced with a dilemma. If he reuses old code, he may save time and have fewer errors in his program because he is using already debugged code, but he may also lose time, incur more errors because of side effects and end up with a program that is not very efficient.

Clearly, a mechanism is needed whereby programmers can safely re-



use code to solve common programming needs without experiencing undue maintenance side effects.

One method aimed at speeding development and simplifying maintenance is structured programming. Beginning with a very high-level "concept" language, an abstract problem is gradually refined until a complete working program written in conventional programming language can be produced.

This methodology, when used properly, can be of great assistance in writing programs. However, it is not much help when it comes time to modify the program since the high-level "concept" statements have now been replaced by actual code, obscuring once clear logical pathways and making the overall structure of the program much harder to understand.

'So-called fourth-generation languages or black box programming aids that hide information or details from the user suffer because they cannot effectively accommodate sophisticated application requirements.'

In addition, modifications are done in a patchwork fashion, altering the logical structure of the overall program in ways that are often difficult to detect. Several modifications further down the road, the program has lost any semblance of the structure it once had.

Chainsaw for Butter

So-called fourth-generation languages or "black box" programming aids that hide information or details from the user suffer because they cannot effectively accommodate sophisticated application requirements. By definition, black boxes cannot be opened up and their internal workings modified to accommodate changing needs.

For simple applications, these tools can greatly speed development. However, as needs become more complex, the powerful verbs embodied in these languages begin to hinder the programming effort, being unable to address complex requirements. It is a bit like using a chainsaw to cut butter. There is no method of easily incorporating unusual requirements below a certain level of abstraction.

Subroutine libraries have traditionally been used as repositories of reusable code. Solutions to common programming problems are written as external subroutines and placed in a common library for general use. Anyone can use these routines to solve specific problems in the course of developing or modifying an application.

However, when a subroutine fails to meet a programmer's exact needs, problems arise. He can either change the routine to meet needs, implying a very difficult retrofit with potentially horrendous maintenance side effects, or he can create another routine in the library with similar but subtly altered characteristics.

But eventually two versions become three, then four, then more. Soon it takes longer to locate and evaluate a subroutine as a candidate for reuse than it takes to write the routine from scratch. Clearly, subroutines do not serve as the ideal vehicle for code reuse, nor do they deal effectively with issues of code modification that on occasion have caused systemwide disruption of programs using common subroutines.

No Flexibility

A subroutine is a representation for a function that is not adaptable at program construction time. It may have considerable runtime flexibility, but at the time of actually molding into a program, a subroutine has no flexibility at all.

Lack of flexibility also explains why the software industry has largely ignored the potential of the code generator. A generator's strength derives from being an expert about a

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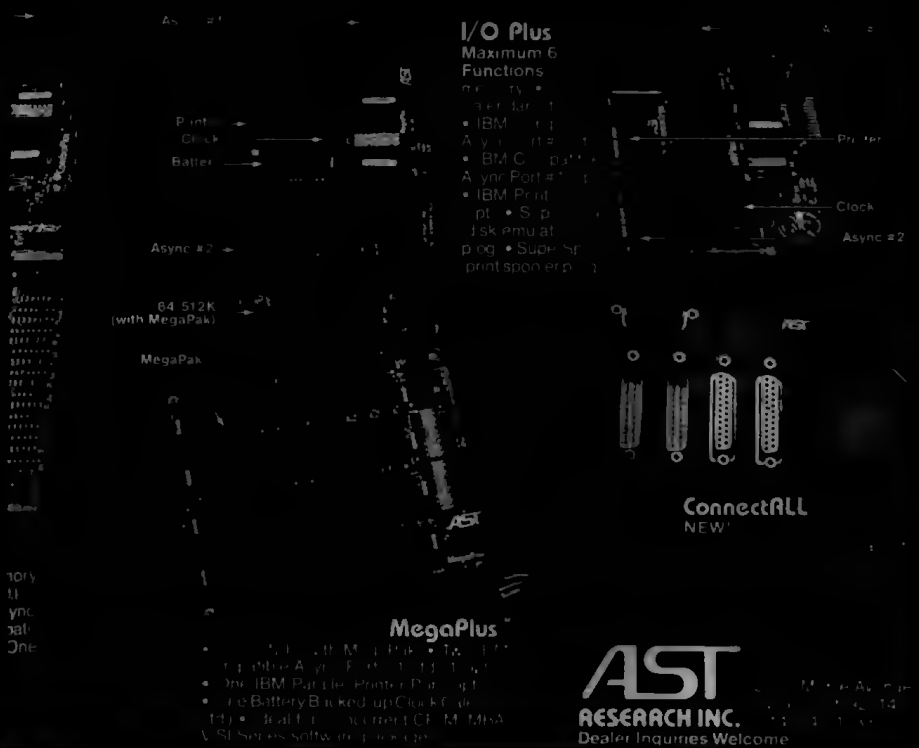

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IN DEPTH

specialized type of processing. It does not try to be a general-purpose programming language.

After a first pass through a generator, there are inevitably changes to be made to the resulting output. Ideally these changes belong in the notation that feeds into the generator. But doing so means clobbering the hours of hand editing invested in the output of the generator's first pass. Sadly, further patching of the generated source code becomes the only recourse, and the generator's productivity and maintenance potential shrinks to relative insignificance.

To be really useful, a code generator must be restricted in scope and provide some mechanism that allows the programmer to reuse the generator while not losing the hours of work he has already spent tailoring the initial generator output.

Divide and Conquer

The shortcomings of code generators, subroutines and current programming practices all underscore the need for a methodology that takes advantage of the functional overlap between programs and permits code to be reused without risk.

The key is that *most programs contain little necessarily unique code.* More importantly, although each program may contribute only 10% of essentially new code to the system, the entire program must be maintained forever as if it were unique. Recognizing this fact permits development of a methodology whereby unique code is stored separately from common, reusable code so it can be maintained independently.

Frame technology makes it possible to resolve effectively the problems associated with code reuse and modification. Frames are best explained by contrast with programs. Whereas a program is a solution to a single problem, a frame is a single solution to many related problems. While traditional programs manipulate and produce data, frames are used to manipulate and produce programs.

Frames are not new concepts. Marvin Minsky of MIT introduced the notion of frames in an artificial intelligence context. Frames permit the "cut-and-paste" style of conventional programming to be replaced with a formal manufacturing process in which the standard subassemblies are frames.

From a maintenance point of view, frames permit the unique or essential parts of a program (that make it distinct from all others) to be defined and stored separately from the reusable code. Rather than being scattered throughout a 30- or 40-page source listing, the essential parts of a program are stored in one location.

A frame can become a standard, reusable solution structure — a software subassembly from which programs can be manufactured as an application of the frame. Using a frame means much more than simply copying code; when constructing programs from frames, arbitrary amounts of code can be automatically inserted in predefined "slots"

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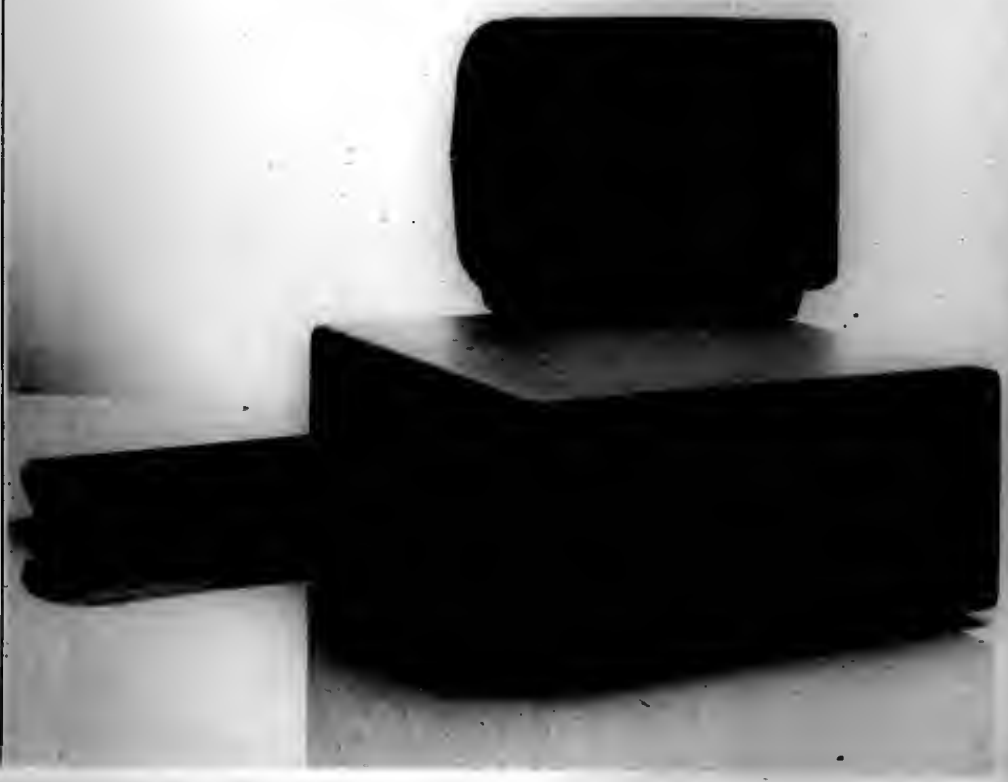

SOFTWARE MAINTENANCE

IN DEPTH

within the frame, renaming variables and so on.

Unlike subroutines, as a frame evolves it never compromises programs written using an earlier version of the frame. Programs using a new or modified version of a common frame will only "recognize" the current version, while older programs will remain unaffected by later changes and need not be retrofitted.

Should a program ever need to be rebuilt, the text produced from the frame at the time the program was first written will automatically be reproduced.

In addition, problems associated with traditional generators are avoided by simply emitting frames instead of raw source code. Using frames, program generators can support the entire life cycle of each program's development and maintenance, rather than the one-shot bootstrap role they conventionally play.

Frames are organized into hierarchies, the most general frames progressively refined by more specific ones. All that is left to create and maintain is a frame containing the code unique to a given program (see discussion on In Depth/46).

File maintenance is a good example of how model solution frames can be set up. Figure 1 (on In Depth/48) outlines the logical structure of a frame hierarchy for designing file maintenance programs. On the left is a model solution frame for general file maintenance procedures at the highest and most abstract level. The terms *Initialize, Maintain Data* and *Disconnect from Data* all refer to processes that are carried out at some lower level of the hierarchy, moving from left to right.

These processes are coded either as raw code (*Extract System Info* in column 2) or other frames.

The shaded regions at each level of the hierarchy represent "slots" where code can be inserted at the time the frame is copied to produce source code. The frame user can, for example, supply custom code to fill the slots prior to, or following, initialization. Some slots are predefined but may be overridden at source construction time; these are represented by the shaded regions containing text.

An example of this process is the *Connect User to Data* slot in column 1 that is predefined by the frame indicated in column 2. If the frame user supplies no code to fill the slot, the frame from column 2 will be used. If, however, the frame user supplies custom code to fill the *Connect* slot in column 1, then the frame in column 2 will not be used.

It may seem that frame hierarchies can become complex and hard to use. However, the frame user does not have to understand or even be aware of the hierarchy. Templates (program skeletons) provide prescriptive, rigorous check lists of all the possible points of customization, reducing the design process to a linear, fill-in-the-blanks exercise from which a specification file is produced that precisely describes the program to be

(Continued on In Depth/48)

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IN DEPTH

The Principles of Frame Design

Frames are meant to be an embodiment of standard, reusable solutions to problems. Being standard and reusable in turn imposes some strong constraints on what constitutes a frame and how it should be structured.

Many existing programs and routines may be candidates for frames. Significant engineering effort will usually be required to ensure that the resulting frame possesses proper standards, is functionally complete and, most importantly, is easily adapted into most contexts of use.

Frames themselves contain the standard functionality as well as prescribing the style in which they must be customized into finished products. Each frame has a distinct, sharply defined goal, useful in several contexts; and it can evolve through time by generalizing its goal and/or improving its efficiency without having an impact on other frames.

There are two types of frames: so-called subroutine frames and mainline frames. A subroutine frame contains a collection of interdependent operators and data management routines, cooperating over a common data structure. In this sense, a subroutine implements an abstract data type. Mainline frames (superroutine) represent control flow scenarios which accomplish generic goals involving a mixture of abstract data types. While mainline frames do not usually reference each other, subroutine frames often do.

Frames ought to be structured so that solutions to subproblems are coded once only. To be used in many contexts, each frame should not do too much. The wider the contexts of its reuse, the more its functionality should be independent of all other frames in the system. A frame should contain a small number of parts, each doing a different, well understood thing and using good structured programming style.

It is a fact of life that software is general and frames, in particular, must change as requirements change. The redeeming features of frames are that they evolve much more slowly than ordinary software, and when they do evolve they can absorb arbitrary amounts of change without victimizing innocent previous users. Each frame simply needs to contain a unique version control symbol such as "Frame-VERSION," where "Frame" is the unique name of the frame. Then, any text that is unique to version 1.2, say, is placed within the version 1.2 select clause.

For example, the frame user references the frame by:

```
.REPLACE FRM6-VERSION BY V0102
.COPY FRM6
```

Inside FRM6 the versions are selected by:

```
.SELECT ;FRM6-VERSION
.WHEN V0101
   frame text for version 1.1
.WHEN V0102
   frame text for version 1.2
.END-SELECT
```

This technique also copes with additions and deletions because any .WHEN clause can be left empty. Even changes to the version naming conventions (e.g. separation into a two-level version hierarchy) can be handled by putting the older scheme into an .OTHERWISE clause which has its version .SELECT nested within. Should the entire frame need rewriting, the obsolete frame code can be placed under an archive file name and referenced from the rewritten version. This technique avoids cluttering up the new code yet is completely transparent to innocent previous users.

Subassembly frames are major capital assets of any CAP software manufacturer. Techniques to design, apply and protect the assets are vital.

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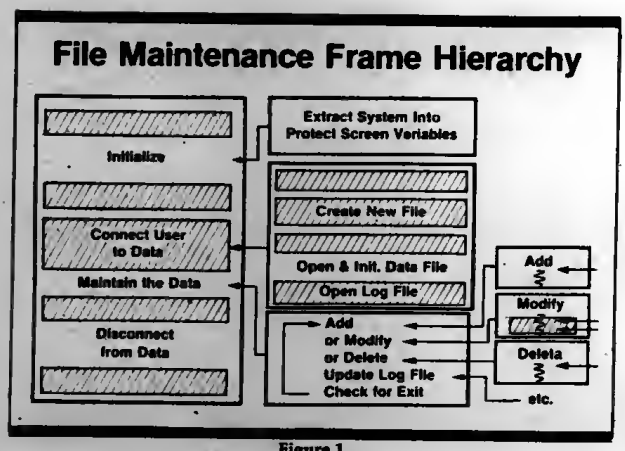

Figure 1

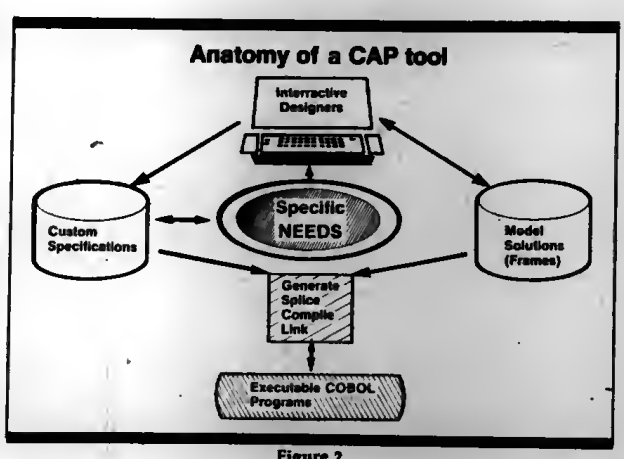

Figure 2

(Continued from In Depth/45)
automatically assembled.

Frames have been implemented in a software manufacturing system known as Computer-Aided Programming (CAP). Figure 2 illustrates how a CAP tool builds a program from specific goal-oriented instructions supplied by the user, automatically blending together standard code modules or frames with computer-generated and custom code to create a working program.

Interactive designers operate at an underspecified level. Only the major functional features of the desired program need be supplied by the user in order to write a complete set of specifications for the program.

Customizers permit editing of program specifications at the optimal level. Here is where all further customization and maintenance of the program is done. At this level, CAP automatically translates the customized specifications into standard code such as Cobol and binary.

Since frames are upwardly compatible, once written, sophisticated functionality can be passed on to all new programs. In a very real sense, frames become the capital assets of a company. Standards are painlessly enforced and the detailed knowledge of a firm's computer applications are retained in an inventory of reusable frames, along with the tools for creating new frames. As a result, loss of invaluable expertise associated with employee turnover is significantly reduced.

The methodology of frames, together with systems such as CAP, promises to significantly reduce maintenance and introduce new methods of automatic program fabrication based on traditional manufacturing processes.

About the Authors

Paul Bassett is vice-president of software manufacturing at Netron, Inc., Toronto, Ont. Theoretical computer science and applied data processing are his areas of expertise.

Scott Rankine, formerly on the staff of Computing Canada, *now serves as research writer at Netron.*

A free report on computer-aided programming is available from Netron, Inc., 99 St. Regis Crescent North, Downsview (Toronto) Canada M3J 1Y9.

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Rabbit System Gives Micros 3270 Emulation

MALVERN, Pa. — Rabbit Software Corp. has announced Rabbit 3270-Plus, a distributed processing system that reportedly allows microcomputers running under Convergent Technologies, Inc. Ctos, Burroughs Corp. Btos and Bell Laboratories Unix-based operating systems to be used as intelligent IBM 3270 workstations for local and host processing.

The product provides 3270 features and allows data to be manipulated locally. It also allows prefetching of host screens and data, recording and browsing of host sessions, split-screen processing and screen sharing between remote and local processing, a spokesman said.

A suspend/resume feature allows processing without breaking the 3270 session. Read-ahead requests the next screen while the host works on the current one. A browse feature allows review of data without additional host transmissions.

Screen-to-Print produces hard copies of screens; Screen-to-File copies host data for local applications; and Asynch 3270 makes an Ascii device function as a 3270 terminal. Other features include Help screens, cursor select and system/user profiles, which enable one terminal to function as a different device while allowing changing of system features and options to fit the application.

The price is $750 per microcomputer from 1 Great Valley Pkwy. E., Great Valley Corporate Center, Malvern, Pa. 19355.

Study Predicts Growth In Packet-Switching Mart

By Bruce Hoard
CW Staff

NORWALK, Conn. — Year-to-year growth rates in packet switching have exceeded 60% in recent years and strong growth will continue until at least 1990, according to a recent study from International Resource Development, Inc.

The study, which is entitled "Packet Switching, Public Services & Private Systems Markets," says that the past decade has witnessed the transition of packet switching from an experimental technology used by government and a few time-sharing firms into one of the fastest growing markets in the telecommunications field.

Furthermore, the study notes that a market for private networks within large organizations has developed "almost overnight."

The study includes 10 sections addressing such topics as packet-switching technology, domestic packet-switched networks, value-added services and trends in packet-switching services.

The section on packet-switching technology explains packet switching's role in data communications and describes the circumstances in which packet transmission is more effective than circuit switching.

Domestic packet-switching companies discussed include Tymnet, Inc., GTE Telenet Communications Corp., Uninet, Inc., Automatic Data Processing, Inc. and Compuserve, Inc.

The rapid growth of international packet networks is also covered. Networks in Canada, West Germany, Belgium, Denmark, Spain, Finland, France, Italy, Norway, the Netherlands, the UK, Sweden, Switzerland and Japan are described in the report.

The study maintains that value-added services "ride on top" of the basic packet-switched transmission offerings and notes the relationship between the value-added market and the basic transmission market. Data base services, teleshopping, telebanking and other transaction-related and information-related services are explored in the study.

A detailed market analysis estimates the current size of the packet-switching market, broken down according to specific application, as well as current market share information.

In addition, figures are given for the public network segment, the private network segment and the X.25 network interface device segment.

Industry trends are discussed on both a macro and a micro level. On a macro level, the reasons for the increased growth are laid out.

On a micro level, however, the likely confrontations between participants in what should be an increasingly competitive environment are explained. That competition will occur between public and private vendors, as well as within the particular market segments, according to the report. In addition, the roles to be played by IBM and AT&T are mentioned.

Projections for future packet hardware shipments, in terms of numbers and dollar values, by market segment are addressed in another section. A discussion of growth expected in specific value-added services available on the networks and the impact of growth on packet-switching markets in general is also included in the study.

Another section in the study offers company-by-company discussions of current products, likely avenues of entrance into or expansion within the market and the prospects for success within the industry of those firms presently involved in packet switching. It also identifies and discusses those firms that are likely to become involved.

The 174-page study of packet switching is priced at $985, and further information can be obtained from International Resource Development, which is headquartered at 30 High St., Norwalk, Conn. 06851.

Lee Data Adds Display Station, Other Units to 3270-Type Line

MINNEAPOLIS — Lee Data Corp. has announced the addition of six products to its line of IBM 3270-type terminal systems.

The new products include:

- Model 1216 — a display station to compete with IBM's recently announced Model 3178 display station. The single-unit purchase price for the Model 1216 with a data entry-style keyboard is $1,411, the vendor said.
- Models 321 and 421 — large cluster control units said to let users access two or more IBM-type mainframes by combining local channel and remote interface in a single controller. On a purchase basis, the Model 321, with 16 dislays, is priced at $39,132, while a Model 421 equivalent configuration is priced at $50,988, according to the vendor.
- Models 306 and 308 — remote-control units compatible with IBM's 3274-51C and 3274-61C units, respectively. Single-unit prices are $5,212 for the Model 306 and $7,057 for the Model 308, the vendor maintained.
- A software facility that reportedly permits Lee Data's Series 400 3270/asynchronous communications system to emulate a Hewlett-Packard Co. 2624-B Ascii terminal. Any of the 3270-compatible displays can be upgraded for $403 on a purchase basis.

Leasing terms are available from Lee Dats, 10206 Crosstown Circle, Minneapolis, Minn. 55344.

HP-Compatible Terminal Added To Direct's 800 Series CRT Line

SANTA CLARA, Calif. — Direct, Inc. has expanded its 800 series of CRT terminals to include an entry-level, block-mode terminal said to be fully compatible with Hewlett-Packard Co.'s 1000 and 3000 systems.

The Model 820 is said to feature two pages of display memory, full video enhancements and on-screen program function keys. The features reportedly allow users to run such HP application programs as V/3000, MM/3000 and Vplus, a vendor spokesman said.

Other features include a standard line drawing set, an 80-col display and such user preference features as modifiable screen intensity and scroll rates, according to the spokesman.

The unit costs $1,495 and information is available from the vendor headquartered at 4201 Burton Drive, Santa Clara, Calif. 95050.

MCI Offers West Germany Link

RYE BROOK, N.Y. — MCI International has announced that telex subscribers throughout the country will be able to communicate via its Western Union International, Inc. subsidiary with teletex subscribers in West Germany, the company has announced.

MCI International subscribers can use a variety of communications equipment, including teleprinters and communicating word processors to prepare, edit and transmit messages via telex to teletex subscribers in West Germany.

MCI Communications Corp. provides through its common carrier subsidiaries domestic and international telecommunications services. MCI is located at One WUI Plaza, New York, N.Y. 10004.

Feature Detachable Keyboards

Televideo Offers CRT Terminals

SUNNYVALE, Calif. — Televideo Systems, Inc. has introduced two CRT terminals that feature detachable keyboards, tilt-and-swivel screens, one-button off-line editing, split-screen mode and nonvolatile programmable function keys.

The Televideo Models 915 and 924 also include built-in memory for off-line editing, the vendor said.

The 924 reportedly has four pages of memory and the 915 is said to carry up to two pages of memory.

Both terminals have built-in printer ports, a vendor spokeswoman said.

Each terminal has from 16 to 32 function keys, which are programmable on the 924. The function keys on the 924 are nonvolatile: Once they are programmed, they remain so until changed by the user, according to the vendor.

Said to be available in June, the terminals are priced at $695 for the 915 and $895 for the 924, according to the vendor.

More information is available from Televideo Systems, Inc., located at 1170 Morse Ave., Sunnyvale, Calif. 94086.

ITI Unveils 'Linkup' For IBM

SCOTTSDALE, Ariz. — Information Technologies, Inc. (ITI) has unveiled Linkup, a communications package for the IBM Personal Computer.

Linkup's nucleus is a programmable hardware module that supports all industry-standard protocols and emulates commercially available terminals at data transfer rates up to 56K bit/sec, the vendor said.

Initial Linkup software options will support TTY, Digital Equipment Corp. VT52/100, IBM 3101 and 2780/3780 emulation, Ascii Block Protocol and a print spooler.

Linkup reportedly supports unattended operation, giving users access to computer services at night, on weekends and holidays when common carrier and computer service rates are lower.

Linkup costs $1,195, including the hardware board and software options, a spokeswoman said. It will be available in June from ITI at 7850 E. Evans Road, Scottsdale, Ariz. 85260.

Display Out For IBM 3270

DALLAS — Harris Corp.'s Interactive Products Division has announced a 12-in. display for IBM 3270 communications. The smaller display was designed for desktop operations where a small footprint is required.

The Model 9178 is said to be functionally compatible with the IBM's recently announced 3178 display. The 9178 display supports all Harris keyboards, including the new 109-key keyboard option, and is available with either green or amber phosphor screens.

The 109-key keyboard option is an ergonomic model featuring a low-profile design and ease of operation.

The Model 9178 will be available in September for either lease or purchase. The purchase price for the 75-key keyboard unit is $1,462; the 87- and 109-key keyboard configurations cost $1,524. Harris Corp. can be reached through P.O. Box 400010, 16001 Dallas Pkwy., Dallas, Texas 75240.

Programmable Controller Boasts Speed, Smart I/O

ANDOVER, Mass. — Gould, Inc. has announced a high-speed programmable controller tailored to mid- and large-control applications that require a combination of high speed, distributed intelligent I/O, large data/recipe storage and expandability.

The 584L programmable controller reportedly has a capability for up to 8,000 I/O points, 10,000 registers, 32 distributed Ascii ports and memory sizes up to 64K bytes.

The software functions of the controller include floating-point mathematics, double-precision math, square roots and logarithms.

Support for the 584L system is provided by a range of I/O modules.

The 584L sells for $19,000. The vendor can be reached through Gould's Modicon Programmable Control Division, Box 83-SVS, Andover, Mass. 01810.

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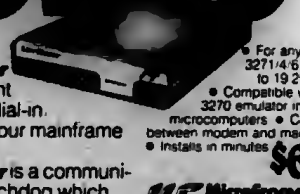
Dial-Up 3270



LineMaster
An intelligent device for dial-in access to your mainframe 3270 line.

LineMaster is a communications watchdog which keeps a line in service until a user dials in.

- For any remote 3271/4/6 line up to 19.2K baud
- Compatible with any 3270 emulator including microcomputers
- Connects between modem and mainframe
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408/727-2980

Canoga Mux Runs at 76.8K Bit/Sec

CANOGA PARK, Calif. — Canoga Data Systems has announced an 8/16 channel multiplexer said to be capable of synchronous data rates up to 76.8K bit/sec with speeds from 2,400 to 76.8K bit/sec and asynchronous operation up to 19.2K bit/sec.

Housed in a rack-mounted chassis, the CMX-816 provides individual data rate programming on each channel in the synchronous mode. The CMX-816 can reportedly be configured with RS-232, RS-422 or V35 interfaces. It also provides three duplex control functions, according to a vendor spokesman.

The CMX-816 is priced at $2,750. More information is available from the vendor at 21218 Vanowen, Canoga Park, Calif. 91303.

Communications Series Fits Osborne 1 Micro

WASHINGTON, D.C. — Cypher Communications Technology, Inc. has announced a series of communications software and hardware for the Osborne 1 personal computer.

Cycom 1 is reportedly aimed at the individual user who requires a communications package for use in file transfer, conversation, dumb terminal emulation, electronic mail or information utility access. It is said to be supported by an autodial, autoanswer modem.

Cycom 2 is said to convert the Osborne 1 into a secure communications terminal. It combines Cycom 1 software with a hardware component that allows for end-to-end communications, including electronic mail, which is transparent to communications media.

Cycom 2 is said to originate and answer telephone communications automatically. It also automatically logs a user on to a remote system, such as a time-sharing service, information utility, data base or microcomputer, according to a vendor spokesman.

Cycom 1 sells for $120. The price of Cycom 2 is $450. More information is available from Cypher at Suite 1005, 1712 1 St. N.W., Washington, D.C. 20006.

Publication To Focus On Europe

MORRISTOWN, N.J. — Probe Research, Inc. has announced a monthly publication devoted to the European telecommunications marketplace and industry.

Researched in Europe and edited by Probe, *European Telecommunications* will deal with such issues as deregulation and new market openings, led by the UK. Also described will be the leading European positions in cellular radio, videotex, teletext and mass information access terminals. National policies to export telecommunications products will also be addressed.

Subscriptions cost $180 in the U.S. and Canada and $195 overseas.

Probe can be reached through P.O. Box 590, Morristown, N.J. 07960.

Dynapac Stat Mux Handles Eight Terminals

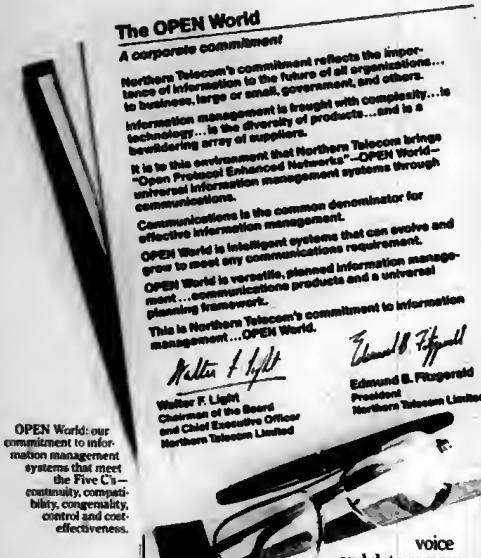
ALEXANDRIA, Va. — Dynapac has introduced its DP-1000 statistical multiplexer, which reportedly accommodates up to eight terminals at each end of a line, enabling the user to mix different terminal characteristics such as speed, flow control, line feed insertion, echoplex and padding delay for mechanical response.

DP-1000 is said to use proprietary multiplexing algorithms based on schemes used in packet-switched networks.

The price of the DP-1000 is $995. More information is available from the vendor at 6464 General Green Way, Alexandria, Va. 22312.

To a world of chaos and confusion, rational approach to

Today, most organizations realize how critical it is to manage information effectively. After all, information is a key resource. So the choices you make today for data processing,



OPEN World: our commitment to information management systems that meet the Five C's—continuity, compatibility, congeniality, control and cost-effectiveness.

voice and data communications, word processing and image communications will determine, to a large extent, your future success.

But deciding on an information management system can be very complex.

Obsolescence is a constant concern. Because of the rapid pace of technology, today's innovation too often becomes yesterday's generation. To compound the problem, the needs of your organization are also constantly changing. How do you know what your requirements are going to be next year?

Also contributing to the complexity is the ever-growing number of suppliers offering a vast array of products and services. Products, which for the most part, are incompatible.

It is a market characterized by chaos and confusion.

OPEN World-finally, an approach that makes sense.

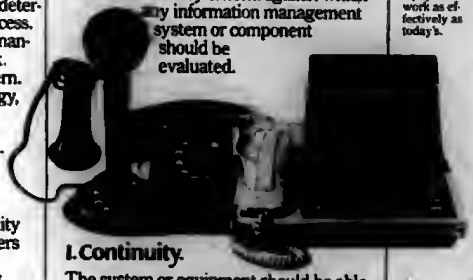
Northern Telecom has introduced a rational approach to the planning and building of information management systems: the OPEN World.* It is based on the simple concept that all information can be handled in one integrated system. One system that will allow many makes and types of equipment and transmission highways to work together harmoniously. One system that will give you freedom to choose from many different suppliers. One system that will evolve to protect against obsolescence.

The OPEN World is a planning framework embodying these concepts, and a program for the introduction of products and features to enable you to plan and build optimum information systems, designed around the key common element—communications.

We're backing the OPEN World with a research and development commitment of one billion dollars to be spent on R & D in the next five years on OPEN World systems, products and features.

The Five C's-five criteria to judge our approach. Or theirs.

There are five key criteria against which any information management system or component should be evaluated.



An example of continuity: we have evolved the telephone network to allow yesterday's equipment to work as effectively as today's.

1. Continuity.

The system or equipment should be able

*Trademark of Northern Telecom Limited

Runs on HP, DEC

Stat Mux Handles Eight Terminals

PITTSBURGH — Black Box Catalog has announced a data concentrator said to be a statistical multiplexer designed to allow two, four or eight terminals to share a single line.

Designed for use with Hewlett-Packard Co., Digital Equipment Corp. and other minicomputers, it requires no changes to existing hardware or software in order to provide each terminal with an apparent direct connection to the host computer.

The terminals may operate in either full-duplex or half-duplex mode at data rates up to 9,600 bit/sec. The concentrator's composite (output) rate can be 9,600, 1,800 or 1,200 bit/sec asynchronous or any synchronous rate within that range.

Standard features include automatic retransmission on error, do-it-yourself installation, troubleshooting and terminal-activated channel.

A two-channel concentrator costs $1,050, a four-channel concentrator is priced at $1,400, and an eight-channel concentrator costs $2,200. Black Box Catalog can be reached through P.O. Box 12800, Mayview Road at Park Drive, Pittsburgh, Pa. 15241.

Raytheon PTS-2000 Gets Local Format Storage

NORWOOD, Mass. — Raytheon Data Systems Co. has announced a local format storage feature for its PTS-2000 Information Display System.

The local format storage option offers users of IBM 3270-type CRT terminals the option of storing more than 100 formats at a remote site. A typical user can reportedly realize a 67% savings in line utilization and possibly cut the number of terminals on each host line. The product can also improve response time and cut operation costs at low speeds, the vendor claimed.

The local format storage feature is available in a special version of Raytheon's large cluster controller operating either in Binary Synchronous Communications or in IBM's Systems Network Architecture/Synchronous Data Link Control modes, the vendor said.

Formats can be created by the user at the terminal location or they can be downline loaded from the host, then stored in the PTS-2000's controller. The information is then compressed in memory and decompressed when brought onto the screen. The local format storage option was designed for use with IBM DB/DC products such as CICS and IMS and costs $8,100, the vendor said from 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

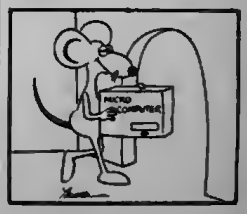
Modem Out From Inmac For Micros

SANTA CLARA, Calif. — Inmac Corp. has introduced a portable 300 bit/sec modem said to put telecommunications capabilities within an economical reach of personal computer users.

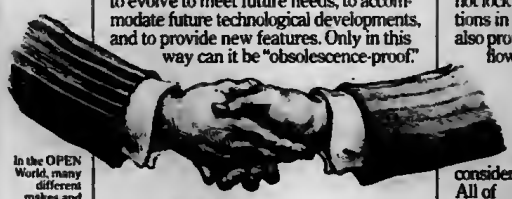
Requiring only a push-button telephone and a modular RJ-11 jack for operation, the Model 8065 reportedly runs on a self-contained 9V battery that provides up to 50 hours of continous use and allows total portability. An audible carrier detect signal tells the user that data is being received and properly entered.

The modem reportedly transmits both voice and data signals over common telephone lines. Other features include an automatic mode selection from originate to answer and vice versa, an automatic talk/data switch and a carrier detect signal.

Guaranteed for one year, the Model 8065 costs $125, Inmac said from 2465 Augustine Drive, Santa Clara, Calif. 95051.



Northern Telecom brings the first information management.



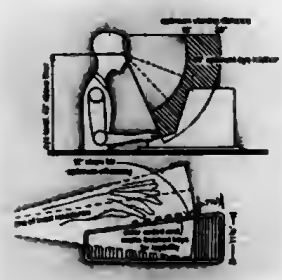
In the OPEN World, many different makes and types of equipment can work together.

to evolve to meet future needs, to accommodate future technological developments, and to provide new features. Only in this way can it be "obsolescence-proof."

2. Compatibility.

Many makes and types of equipment must be able to work together as a harmonious whole. Components and systems from different manufacturers and transmission channels from different suppliers all must be compatible.

3. Congeniality.

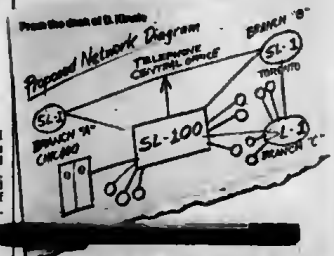


If people find equipment or systems intimidating, unattractive, or difficult to use, they simply won't use them. Even advanced technology should be attractive and simple to use.

OPEN World systems are congenial—designed for ease of use and comfort.

4. Control.

You, not a supplier, should be in control of your information



In the OPEN World, you can control the design, building and operation of your system.

management system. The system should not lock you in to a single source or limit options in the future. And the system should also provide the tools to control the cost and flow of information in your organization.

5. Cost-effectiveness.

The bottom line. Long-term financial considerations, as well as initial cost, must be considered. All of the other four criteria—continuity, compatibility, congeniality and control—have a bearing on cost-effectiveness.

In the OPEN World, cost effectiveness is the bottom line.

OPEN World—the Five C's plus commitment.

As the international leader in digital telecommunications, the technology that ties computers and communications together, Northern Telecom is in the unique position of being able to make the OPEN World a reality.

Our technological heritage allows us to meet the five criteria conclusively, as we have always done, for example, in providing equipment for the telephone network. When you place a long distance call, it may pass through many generations of equipment, all working smoothly together. Use of the telephone is simple, although much complex technology is involved. And the relative cost of using the telephone has steadily decreased, although its capabilities are constantly expanding.

In supplying telephone equipment for over 100 years, we've met all the criteria we propose for business communications.

If you'd like a brochure describing our commitments to each of these criteria, or more information about the OPEN World, write OPEN World, Northern Telecom Inc., 259 Cumberland Bend, Nashville, TN 37228.

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DATA GENERAL INTRODUCES THE OFFICE AUTOMATION SYSTEM INGENIOUSLY POSITIONED BETWEEN THE OVERPRICED AND THE OVERPROMISED.

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The CEO™ Comprehensive Electronic Office system based on the industry's newest and most powerful 32-bit processor—the Data General ECLIPSE® MV/10000. It provides the power and performance of a mainframe at less than one third the price. And can bring down the cost of automating large organizations to under $7500 a workstation.

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And CEO systems enjoy another advantage worth considering in an industry that's been more timely with new product announcements than with the new products themselves. Our systems exist, they're backed by a worldwide service and support network already in place, and they're available now.

All of which gives you two things you've been denied up until now:

A reasonable price.

And reason to believe you'll get what you've been promised.

For more information on the complete line of Data General office automation systems, write to Data General, CEO 30, 4400 Computer Dr., Westboro, MA 01580.

Data General

Comboard Front Ends Communicate via 3780

COLUMBUS, Ohio — Software Results Corp. has added to its Comboard series of front-end processors the ability to communicate via 3780 protocol to Digital Equipment Corp.'s VAX-11 and PDP-11 systems.

Comboard/3780 reportedly performs all of the remote job entry communications processing at speeds up to 56K bit/sec. The offloading of the processing from the DEC CPU reportedly allows the DEC computers to process user applications more efficiently.

Comboard/3780 routes files directly from the central system to end-user disk areas. The end user is automatically notified when the files are placed in his area, the vendor said.

Comboard/3780 also has the ability to act as a central system, a vendor spokesman said. This feature is said to allow the DEC systems to communicate with personal computers or any remote job entry station that has the ability to communicate via 3780 protocol.

Comboard/3780 ranges in price from $9,800 to $17,900. More information is available from the vendor at 2887 Silver Drive, Columbus, Ohio 43211.

High-Resolution Screen

AED Unveils Graphics Unit

SUNNYVALE, Calif. — A color graphics terminal said to have a high-resolution display screen was introduced by Advanced Electronics Design, Inc. (AED).

The AED 1024 is aimed at applications such as computer-aided design, manufacturing and engineering, process display, simulation, graphics art and medical display. It features a 1,024 pixel by 768 pixel screen, an antialiasing feature and 1,024 by eight virtual address space to define any screen display further. It also features 256 colors that can be displayed simultaneously and emulation of the Textronix, Inc. 4010 family of storage tube terminals.

The AED 1024 is said to be completely compatible with AED's 512 and 767 graphics terminals. It has eight memory planes, a green drafting grid and operates in a bit-map mode.

The AED 1024 color graphics terminal is available for $9,995, including base and keyboard. The high-resolution 19-in. monitor costs $3,300 from AED, 440 Potrero Ave., Sunnyvale, Calif. 94086.

Mux Speeds Off-Line Tests

SANTA MONICA, Calif. — Pioneer Research has unveiled the PR-1100 multiplexer, which reportedly speeds off-line testing of multiple drives by allowing up to four storage module device (SMD)-interface disk drives to be connected to a single Pioneer Research PM-4000 Qualifier.

The multiplexer is intended for burn-in, manufacturing test, incoming inspection and general-purpose applications. In a multiple drive test system, the PR-1100 is said to allow the user to set up a system of overlapping seeks that tests four drives in only 50% more time than a single drive.

To configure the system, the user connects the Qualifier cable to the PR-1100 multiplexer, then attaches the B cables from the multiplexer to each of the SMD drives. A cables are "daisychained" from the Qualifier to each of the drives.

Single-quantity price of the PR-1100 multiplexer is $1,000, the vendor said from 1745 Berkeley St., Santa Monica, Calif. 90404.

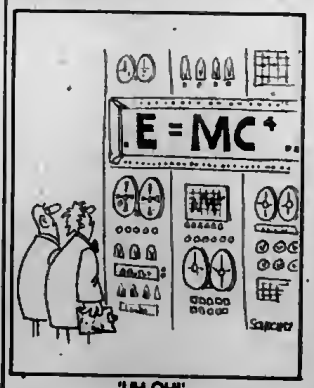
Digitech Cuts Monitors' Prices

RIDGEFIELD, Conn. — Digitech Industries, Inc. has announced price reductions for its Pacer 103 and Data Monitor 200.

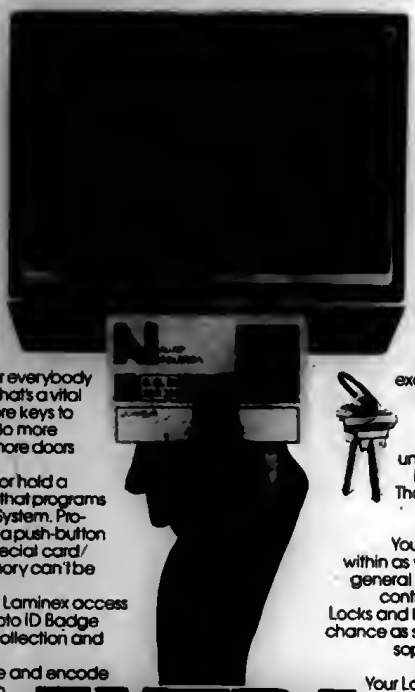
Pacer, a passive data line monitor and interactive simulator, is now base-priced at $5,995, a reduction of 29% from its previous price of $8,500.

At $2,995, the Data Monitor 200 price has been reduced 40% from its previous level of $4,995.

Digitech Industries is headquartered at 66 Grove St., Ridgefield, Conn. 06877.



'UH-OH!'



Laminex puts security control in your hands.

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You or your security director hold a unique access card and code that programs your Laminex Access Control System. Programming is as easy as dialing a push-button telephone. And without this special card/code, your system and its memory can't be compromised.

Versatility is built in to your Laminex access cards. They can serve as a Photo ID Badge as well as providing for data collection and time and attendance.

What's more, you laminate and encode your own cards at your location. There are no delays. If a card is lost or stolen, you can delete the card number from the system's memory within seconds.

Here's another important feature. Your Laminex access cards are made with tough polyester. They resist cracking and deterioration even under adverse conditions.

And they protect you from routine card duplication — an excellent security feature in itself.

Conventional security measures are outdated.

Every morning's headlines underscore the fact that crime is increasing all across America. That's why management people like you are taking steps to strengthen security.

Your operation faces threats from within as well as outside. Access to your general environment is often as vital to control as access to internal areas. Locks and keys no longer have a fighting chance as security measures. You need a sophisticated solution to increasingly sophisticated threats.

Your Laminex Access Control System is a simple, economical, effective solution that translates computer technology into access control designed for your everyday use. It won't solve all your security problems. But when you combine it with other security practices, you'll have protection for life and property that's really extraordinary.

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To reach our network, all it takes is either an X.25 software package or our on-site microprocessor-based interface equipment.

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It's designed especially for executives who are responsible for the selection or use of micros in their organizations, executives who use micros as decision support tools, and business managers who employ (or want to employ) micros to manage their businesses.

The Conference Program

Thursday, June 23 & Friday, June 24

The Thursday and Friday conference program is divided into four major "tracks," but you are not required to sign up for a particular group of sessions. You may select the sessions you need from any of the 48 sessions available and create a conference program designed to suit your unique information needs. You may even choose to attend one day instead of two if you want. A detailed agenda will be sent to you prior to the conference for your advance planning, so you don't waste a minute!

Special General Session for Thursday Attendees:

The Revolt of the Masses: Micros and the Changing Role of DP. *(5:00-6:00 p.m.)*
Dr. Michael Hammer, President, Hammer & Company

1. Personal Computing in a Corporate Environment

For Executives in large corporations who are involved in using micros in distributed data processing or as standalone executive workstations, the EMCE conference program includes:

Keynote: Increasing Corporate Productivity via the Personal Computer *(Thurs., 9:00-10:00 a.m.)*
Mayford Roark, Executive Director of Systems, Ford Motor Company

The Executive/Professional Workstation *(Thurs., 10:00-11:00 a.m.)*
Evelyn Wilk, Consultant, Arthur Andersen & Co.

DDP with Microcomputers *(Thurs., 2:00-3:30 p.m.)*
Moderator: Jerrold Essen, President, Office Sciences International
Panelists: Phil Dixon, MIS Manager, Apple Computer; Robert A. Miller, Special Assistant to the Deputy Secretary of Treasury, U.S. Treasury Department

The Information Resource Center *(Friday, 3:45-5:15 p.m.)*
Moderator: Thomas Kosnick, Researcher, Stanford Business School;
Panelist: Alan Gross, Director of Systems, International Paper Company

The Role of Apple and IBM in Corporate Computing *(Friday, 3:45-5:00 p.m.)*
Moderator: David Bunnell, Publisher, "PC World"

New Issues of Confidentiality and Security in Organizational Information Processing *(Friday, 9:00-10:00 a.m.)*
Professor Alan F. Westin, Columbia University

Personal Computer Acquisition and Implementation Strategies *(Friday, 10:00-11:00 a.m.)*
Don L. Eddy, Principal, Office Futures Now, Inc.

Compatible Systems and Software for the IBM PC *(Friday, 2:00-3:30 p.m.)*
Moderator: Steve Cook, Technical Editor, "PC World"
Panelists: Chris Larson, Product Marketing Manager, MS/DOS, MicroSoft; Steve Flannigan, VP Software, Compaq Computer Corp.

2. Introduction to Microcomputing and its Applications

For Executives who are concerned with the selection and use of microcomputers primarily in smaller businesses, the EMCE conference highlights:

Keynote: The Personal Computer: The Mouse that Roared! *(Thurs., 9:00-10:00 a.m.)*
Lew Kornfeld, Director, Tandy Corporation

How to Buy a Personal Computer *(Thurs., 10:00-11:00 a.m.)*
Lawrence Govoni, Director, Govoni Microcomputer Training School, Boston, MA

Spread Sheet/Financial Applications *(Thurs., 2:00-3:30 p.m.)*
Moderator: Hannah Blank, Vice President-MIS, Chase Manhattan Bank
Panelists: Seneel Kelkar, Mktg. Mgr., Standalone Products, VisiCorp; Russell Warner, Product Mktg. Mgr., End user Products, MicroSoft

New and Future Trends in Personal Computing *(Thurs., 3:45-5:00 p.m.)*
John C. Dvorak, Editor, "InfoWorld"

Word Processing Packages for Personal Computers *(Friday, 9:00-10:00 a.m.)*
Susan Harmon, President, Transitions

DBMS on Personal Computers *(Friday, 10:00-11:00 a.m.)*
Adam Green, President, SoftwareBanc

A Look at Integrated Software Packages *(Friday, 2:00-3:30 p.m.)*
Moderator: Dan Coursey, Sr. Market Analyst, International Data Corporation
Panelists: Chris Morgan, VP, Communications, Lotus Development Corp.; Brian Fischer, Sr. Vice President, Context Management Corp.; Roy Folk, OEM Customer Mktg. Mgr., VisiCorp

Panel: Executive Personal Computer Success *(Friday, 3:45-5:15 p.m.)*
Moderator: Alan Snider, Partner, Laventhol & Horwath

3. Technological Developments in Personal Computing

For Executives who wish to keep up with changing microcomputer technologies in mass storage, business graphics, operating systems, and more, the EMCE conference highlights:

Keynote: The Future of Personal Computer Software for Business *(Thurs., 9:00-10:00 a.m.)*
Dan Fylstra, Chairman, VisiCorp

What's New in Peripherals *(Thurs., 10:00-11:00 a.m.)*
Peter Burgess, President, Burgess Management Associates

Developments in Personal Computer Business Graphics *(Thurs., 2:00-3:30 p.m.)*
Moderator: Dave Needle, Sr. Writer, "InfoWorld"

Developments in Mass Storage Capabilities *(Thurs., 3:45-5:00 p.m.)*
Moderator: Will Zachmann, VP, Office of Technology Assessment, International Data Corporation

Utilities *(Friday, 10:00-11:00 a.m.)*
Haines Gaffner, President, LINK

Popular Programming Languages *(Friday, 10:00-11:00 a.m.)*
Gordon Eubanks, Vice President, Commercial Systems Division, Digital Research, Inc.

Operating System Selection: 8 to 16 Bit *(Friday, 2:00-3:30 p.m.)*
Moderator, Maggie Canon, Editor-in-Chief, "InfoWorld"
Panelists: Gordon Eubanks, VP-Commercial Systems, DRI; Jean Yates, President, Yates Ventures; Mark Ursino, OS Marketing Mgr., Microsoft Inc.; Natalie Shuttleworth, Manager of OS Mktg., Apple Computer

Developments in Networking *(Friday, 3:45-5:15 p.m.)*
Moderator: Will Zachmann, VP, Office of Technology Assessment, International Data Corporation
Panelists: Mark Stahlman, Dir., Mktg. Development, General Instrument Corp.; Art Simon, Director of Mktg., Commercial Services, Warner-Amex Cable Communications Inc.

4. Microcomputer Market Opportunities

For Entrepreneurs, Dealers, Distributors and Systems Houses, we'll offer sales and venture capital strategies you won't want to miss. Session highlights include:

Keynote: Retail Opportunities in the Personal Computer Marketplace *(Thurs., 9:00-10:00 a.m.)*
James Finke, President, Internetworx, Inc.

Software Packaging and Distribution *(Thurs., 10:00-11:00 a.m.)*
Will Luden, Director of Marketing and Retail Communications, Micropro International

Raising Venture Capital for Software and R&D *(Thurs., 2:00-3:30 p.m.)*
Moderator: Jim Furneaux, Partner, L.F. Rothschild, Unterberg, & Towbin

Legal Issues for the Retail Distributor *(Thurs., 3:45-5:00 p.m.)*
Walter Klasson, Brown, Raysman & Millstein

Market Update: Competition from Japan *(Friday, 10:00-11:00 a.m.)*
Robert C. Wood, President, Robert Chapman Wood Company

Successful Training Strategies for Vendors and End Users *(Friday, 2:00-3:30 p.m.)*
Sue Cornwall, NEC Information Systems; Stephanie Rosenbaum, President, Tec-Ed

Delivering Good Maintenance, Service & Support *(Friday, 3:45-5:15 p.m.)*
John Harnett, Director of Planning and Development, TRW Customer Service Division

Selling the Corporate Account: Problems & Pitfalls *(Friday, 9:00-10:00 a.m.)*

Special Program for Educators

Saturday, June 25

Co-sponsored by T.H.E. Journal

For Educators and Administrators, EMCE will hold a special seminar on Saturday, June 25th entitled Microcomputers in Education which includes the following sessions designed to suit the unique needs of education:

Keynote: Computer Assisted Instruction in Education *(8:30-9:30 a.m.)*
Dr. Sylvia Charp, Editor-in-Chief, T.H.E. Journal

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Exposition that's as serious about personal computing as you are.

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- **3 days of exhibitions**
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- **Micros in smaller businesses**
- **Financial applications**
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- **Future trends**
- **And much more!**

The Executive Microcomputer Conference and Exposition (EMCE) is sponsored by the Conference Management Group of CW Communications/Inc., publishers of *Computerworld*, *InfoWorld*, *ISO WORLD* and *PC World*.

Computer Funding and Acquisition *(9:30-10:30 a.m.)*
Ann Cullather, Education Legislation & Technology, Washington, D.C.

Logo: An Educational Language *(10:45-11:45 a.m.)*
Richard Carter, Director, Educational Laboratories, Lesley College

Teacher Training *(1:15-2:15 p.m.)*
Kevin Dwyer, Training Director, Unicom

Administrative Applications for Educational Institutions *(2:15-3:15 p.m.)*
Patricia Carter, Computer Applications Specialist, MASBO Co/Op

Educational Computing at Home *(3:30-5:00 p.m.)*
Moderator: Scott Mace, Sr. Editor, "InfoWorld"
Panelists: Ken Komoski, Executive Director, Educational Products Information Exchange Institute; Richard Robinson, President, Scholastic Inc.

Special Hands-On Workshop

Thursday, June 23 & Friday, June 24

In addition to the main conference program, EMCE will offer a two-day Executive Microcomputer Workshop for those professionals who wish to get hands-on experience with an Apple or IBM Personal Computer. The workshop will focus on four specific applications: spreadsheet analysis using VISICALC, data base management using dBase II, graphics and communications. An in-class network will be set up to demonstrate the communications capabilities of personal computers. The two-day seminar will run concurrently with the EMCE Conference program and will include admission to the exhibits and special feature sessions on Saturday, June 25.

The Executive Microcomputer Workshop will be sponsored by the *Personal Computer Learning Center of New York City* and will be held at the Center, located at 1120 Avenue of the Americas, on Thursday and Friday June 23 & 24th. **Enrollment is limited**, so please register early with your choice of hands-on using either an Apple or an IBM PC.

FREE Feature Sessions for All Saturday Attendees

FREE Special Feature Sessions for all Saturday EMCE attendees (exhibit or conference) will be held Saturday, June 25 from 9:00-1:00 p.m. The sessions will focus on professional applications for micros and starting your own home based business or office, and will also discuss the personal computer's impact on family life, kids and recreation.

1. The Home Office — Basics

Getting Started — Hardware & Where to Buy *(9:00-10:00 a.m.)*
Daniel P. Coursey, Senior Market Analyst, International Data Corp.

Software Applications — Selection & Uses *(10:00-11:00 a.m.)*
David Lamb, Sr. Research Associate, LINK

Setup & The First Six Months *(11:00 a.m.-12:00 noon)*
Paul Conover, President, Praxsys Communications

Programming Languages *(12:00 noon-1:00 p.m.)*
A. Richard Miller, Partner, Miller Microcomputer Services

2. Professional Applications

A Look at Spread Sheet Applications *(9:00-10:00 a.m.)*
Ralph Wagner, President, Microsource/Financial, Inc.

Investment Management Applications for Micro's *(10:00-11:00 a.m.)*
Jan Zonderman, Contributing Editor, "Computer Update"

On-line Data Base Systems *(11:00 a.m.-12:00 noon)*
Steven Sueck, Dir., Electronic Information Program, LINK

Word Processing Packages for Microcomputers *(12:00 noon-1:00 p.m.)*
Ronnie Marshak, Contributing Editor, "The Seybold Report"

3. Home/Family Microworld

Household Management *(9:00-10:00 a.m.)*

Micros for Organizations & Groups *(10:00-11:00 a.m.)*

Home Micro-Based Businesses *(11:00 a.m. - 12:00 noon)*
A. Richard Miller, Partner, Miller Microcomputer Services

Micros: Impact on Family Life, Kids & Recreation *(12:00 noon-1:00 p.m.)*
Dan Oehlsen, Executive Producer, Children's Computer Workshop

Over 100 Professional Exhibits at EMCE

EMCE exhibits offer the latest in business-oriented hardware, software, peripherals, systems, accessories and resources from a wide selection of suppliers including companies like IBM, Digital Equipment Corporation, BASF Systems Corp., Computerland, Addison Wesley, GRID Systems, Micro Systems International, Key Software and Victor Electronics . . . to name just a few. EMCE's designed for you to see, touch and learn what you need to know about micros. **Your conference registration includes complete, 3-day exposition attendance.** Or you can sign up for the exhibits only. If you register in advance, using the form in this ad, you get two bonuses:

1. **Early admission** — only conference registrants and advanced registrants will be admitted to the hall between 11 a.m. and NOON on Thursday and Friday.
2. **$5.00 discount** on admission price.

Register for EMCE now! The Sheraton Centre in New York City is the place; June 23-25, 1983 are the dates. Exposition hours: 11-7, Thursday and Friday; 10-6, Saturday. For more information on the conference and exposition, dial 1-800-225-4698 (In Massachusetts, 617-879-0700) and ask for Louise Myerow.

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Executive Microcomputer Conference & Exposition

Conference Registration

Includes Complete Exhibit Admission with 11:00 a.m. early admission privilege

- ☐ Full Two-Day Conference Registration* — $295
- ☐ One Day Conference Registration — $195
  ☐ Thurs. only ☐ Friday only
- ☐ Executive Microcomputer Workshop* — $595
  Thurs. and Friday
  Choose one: ☐ Apple ☐ IBM PC
- ☐ Micros in Education — $ 95
  Sat. June 25

*Includes Saturday Special Features Programs

Conference registrants only may register by phone. Call 800-225-4698. In Mass. call collect 617-879-0700 and ask for Louise Myerow.

Registrations Cancelled later than June 15 are subject to a $50.00 service charge. Registration may be transferred at no charge.

EMCE — Sheraton Centre, New York City June 23-25, 1983 EMC3

- ☐ YES! Register me for EMCE (fill out attached conference form)
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SAVE $5 by Registering in Advance and Get Early Admission. (Only Advance registrants will be allowed into show between 11:00 a.m. and NOON on Thursday and Friday)

- ☐ Advance *Pre-Paid 3 day exhibit* registration $20 ($25 at door)
- ☐ Advance *Pre-Paid 1 day exhibit* registration $10 ($15 at door)
  ☐ Thurs. ☐ Friday ☐ Saturday

3-Day Exhibit Registration Includes Special Feature Sessions on Saturday, June 25th from 9:00 a.m. to 1:00 p.m.

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Upgradable From Eight Users

Convergent Unveils 128-User Megaframe

By Bob Johnson
CW New York Bureau

NEW YORK — A computer system which is said to be field-upgradable and capable of supporting a range of computers from an eight-user minicomputer to a 128-user mainframe was introduced by Convergent Technologies, Inc. here last week. Called the Megaframe, the product uses a multiprocessor architecture which in its high-end configuration can handle up to 36 processors, 128 users, 24M bytes of error-correcting random-access memory (RAM) and 21.6G bytes of external disk storage, according to the company.

Megaframe uses Convergent's real-time Ctos operating system and a distributed virtual memory version of Unix in order to share system resources transparently to the user or application. Unix-based languages supported are Cobol, a Basic compiler and interpreter, full Fortran 77, Pascal and C. Ctos supports real-time software including communications programs and CT-Isam for multiuser access to common information.

Users of the product can mix and match dumb RS-232C terminals with Convergent workstations and Model PT terminals, the company said.

Up to 36 board-level processing units working in parallel on a high-speed 32-bit bus can be linked by the system, Convergent noted. Systems can grow by plugging additional processors into each system enclosure; when all six card slots in the first enclosure are full, expansion enclosures are added. The maximum six-enclosure system offers 36 card slots and supports up to 1.15G bytes of internal disk storage and 21.6G bytes external small modular device storage.

A spokesman for Convergent said that the Megaframe's architecture eliminates traditional shared-logic bottlenecks by letting users configure a system with the appropriate number of processors of each type. The right combination of types depends on whether the application mix is CPU-intensive, terminal-intensive or I/O-intensive, he added.

Convergent Technologies' Megaframe

"Each of up to 36 processors is running its own operating system, but all are executing in parallel. At the same time, the application processor is executing programs and the file, terminal and cluster processors are all handling their respective functions."

Each processor in the Megaframe contains 0.25M- to 4.0M bytes of RAM and its

(Continued on Page 122)

Microfilm System Flexible Solution For Claims Group

OLYMPIA, Wash. — Despite an ever-increasing work load, the state of Washington's Employment Security Department has been able to handle more claims with 19 fewer people and 3300 fewer square feet by implementing an efficient microfilm filing and retrieval system.

According to Deputy Assistant Commissioner Clinton Petty, this translates into savings of more than $150,000 a year, which he said would have been spent on staff additions had the department not installed the Kodak Corp. Oracle equipment for two of its largest data files.

"We could have partly justified the microfilm equipment just on the basis of more than 3,000 square feet of space saved — valued at $25,000 annually," Petty said. But once the system was installed, the microfilm's flexibility proved most valuable to the state, compared with its old paper filing system.

"About the only nonroutine thing one can do with a folder of paper is lose it,"

(Continued on Page 122)

'Hidden Computer' Takes to Factory Floor

By Dennis Livingston
Special to CW‡

The control of manufacturing operations has increasingly come under the domain of microprocessor-driven equipment. While some of this equipment takes the form of familiar micro, mini and mainframe computers, one of the more important devices used for shop-floor control does not resemble computers at all. This is the programmable controller, a hidden computer which has helped spread the influence of the ubiquitous chip from the executive suite to the factory.

A controller is used to monitor and direct machine manipulations and industrial processes. Tasks carried out by machines under control may include shaping and cutting metal, routing parts along transfer lines, assembling parts at workstations, storing and retrieving materials, packaging goods, regulating the flow of liquids and gases and managing energy use.

For most of the 20th century, the remote control of machines engaged in such activities has been achieved through the use of devices custom-designed from electro-mechanical components such as relays, timers and steppers. In assembling this type of controller, the first step is to establish the sequence of events to be performed by the machine or process being controlled.

For example, a machine in an automotive or airplane factory might have the responsibility for acquiring a part, turning it, cutting it and placing it on an assembly line. This sequence is translated into a set of visual symbols known as ladder logic. Each "rung" on the ladder represents a particular logic function, such as timing and counting, to be undertaken by the controller.

Using the ladder diagram, an engineer then connects the required parts to form the controller. Streaming out from one side of the controller is a complex set of wires linking the device to the components needed to manage the machine, including valves, motors, gates, switches, sensors and the like. Snaking into the other side of the controller is an-

(Continued on Page 124)

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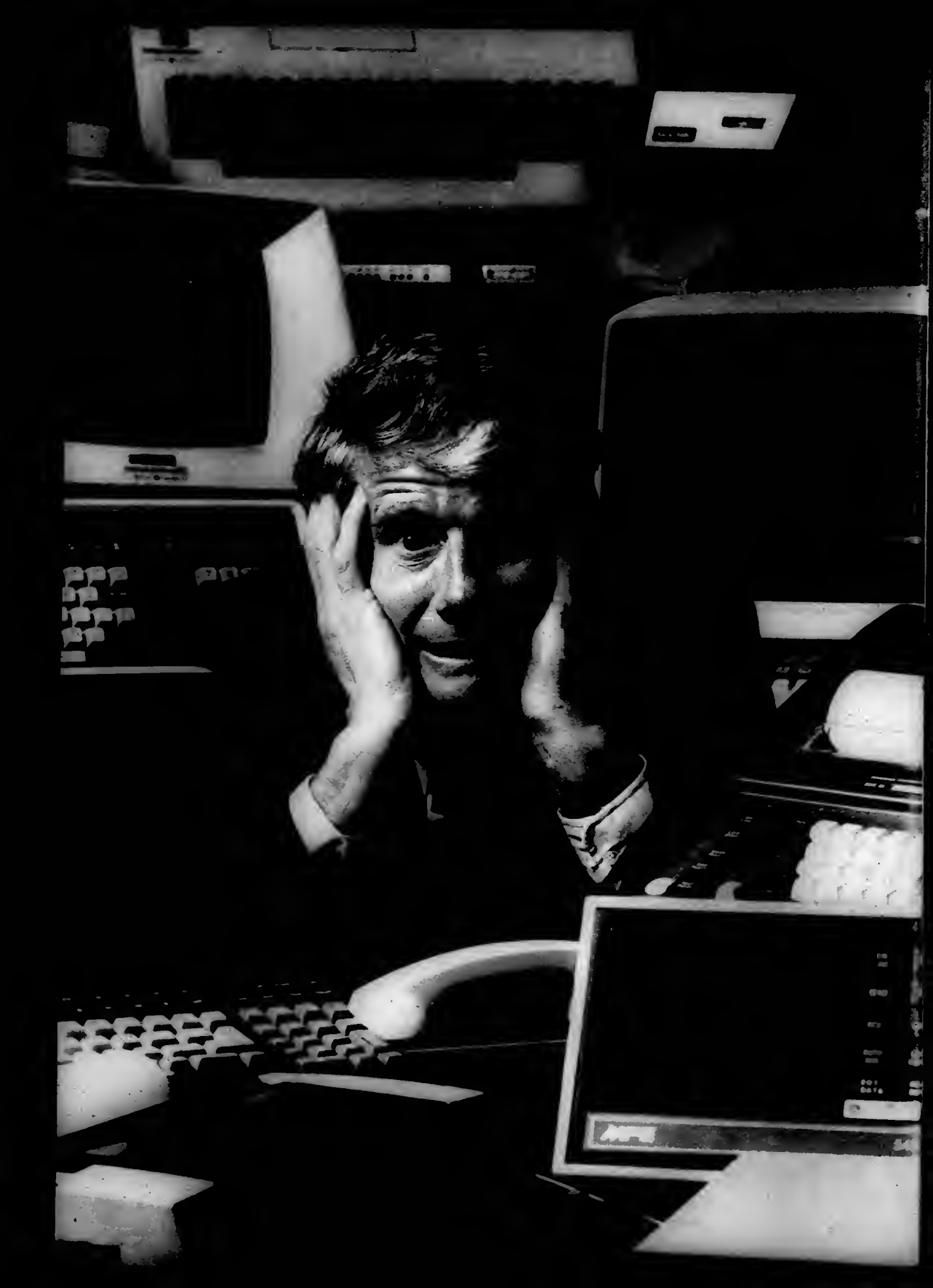

ARE YOU SUFFERING FROM PERIPHERAL SCHIZOPHRENIA?

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GENERAL ELECTRIC

Attached Processor Ups Power of DEC Systems

HUNTINGTON BEACH, Calif. — Ranyan Computer Enhancement Systems has announced an attached processor designed to increase the computing power of the Digital Equipment Corp. LSI-11, PDP-11 and VAX-11 series processors.

Called the APS-1, the unit operates as a slave to the main processor. The main processor assigns tasks according to its own needs. Multiple APS-1 systems may be attached to a single primary CPU and all interaction between the host and slave processors is controlled transparently through sharing of the host main memory, the vendor said.

The attached processor can be assigned to a variety of calculations or I/O processes. For example, the host processor can start or stop the attached processor, download a task image or pick up task results through shared memory.

The APS-1 consists of Ranyan's peripheral processor link and a DEC LSI-11/23S processor. The unit is connected to the host processor via a 50-conductor ribbon cable. The attached processor may have between 64K and 256K bytes of dedicated memory for calculations and I/O processing. The attached processor can share as much as 256K bytes of the host processor's memory for data transfer, the vendor said.

APS-1 systems cost from $7,400, the vendor said from 15239 Springdale St., Huntington Beach, Calif. 92649.

Three-Pen Plotter Out for Micro Users

KENT, Wash. — Mannesmann Tally Corp. has introduced a high-performance three-pen plotter for personal computer users.

At the same time, the vendor announced an immediate 25% price cut on its Model MT160 printer for personal computers.

The newly developed three-pen plotter, called Pixy, can reportedly operate with the IBM Personal Computer, the Apple Computer, Inc. Apple II and IIe and various other computers used in business applications. The product can produce charts, graphs, histograms and other forms of graphics displays on standard 8½-in. by 11-in. paper or on transparencies at speeds of up to 200 mm/sec, according to the vendor.

Its memory includes a 96-char. Ascii set, Greek, scientific characters and nine international language sets, the vendor added.

The Pixy plotter with a parallel interface sells for $795.

The vendor is located at 8301 S. 180th St., Kent, Wash. 98032.

SKS Unveils Versions Of Micros

COLUMBUS, Ohio — SKS Computers, Inc. has announced a portable microcomputer which is available in both 8- and 16-bit versions.

Called the SKS 2502 Nano, the 8-bit version is compatible with SKS' line of desktop systems. The unit is equipped with dual 5¼-in. 400K-byte minifloppy disk drives, a Zilog, Inc. Z80A microprocessor with 80K bytes of random-access memory (RAM), an integrated CRT, detached keyboard and two RS-232C serial ports. The unit comes with Digital Research, Inc.'s CP/M operating system and costs $2,495.

The basic 2502 Nano system can also be equipped with a 16-bit Intel Corp. 80186 microprocessor the company plans to make compatible with IBM's Personal Computer. Also included with the 16-bit version are 128K bytes of RAM, one parallel port or a 5¼-in. 5M-byte Winchester hard disk drive. The unit costs $3,295, the vendor said from 4091 Leap Road, Hilliard, Ohio 43026.

IF KNOWLEDGE IS POWER, HERE'S A DIRECT LINE

Altos Micros Get Expanded Memory Capacity

SAN JOSE, Calif. — Altos Computer Systems, Inc. has announced the addition of an expanded memory capacity configuration to its 586 family of 16-bit networking multiuser microcomputers.

The 586-14 has 5¼-in. hard-disk capacity or roughly 40M bytes and can reportedly be expanded to 80M bytes, the vendor said. The 586 family is based on Intel Corp.'s 10-MHz version of the 8086 microprocessor. These systems run the Microsoft, Inc. Xenix operating system, Altos added.

The system will support both Altos-Net and Ethernet local-area networking, plus X.25, IBM's 3270, 3780 and Systems Network Architecture protocols. Main memory is said to contain 512K bytes, expandable to 1M byte. Other features include intelligent hard disk and tape controller, memory management, six serial ports and battery-backed clock/calendar, the vendor said.

Pricing on this product line starts at $7,990. Further details may be obtained from Altos at 2641 Orchard Pkwy., San Jose, Calif. 95134.

Personal Business Systems Debut

SAN JOSE, Calif. — A newly developed line of 16-bit personal business systems has been unveiled here by Durango Systems, Inc.

Named Poppy, the five offerings are designed to meet the nontechnical business user's requirements for one to 12 workstations in a multiuser, multitasking environment, the vendor reported. The choice of software operating systems includes Microsoft, Inc.'s MS-DOS and Xenix, as well as Digital Research, Inc.'s CP/M 86. Poppy customers will also have immediate access to generic and applications software developed for business by Durango, the vendor added.

A basic Poppy system consisting of a 16-bit microprocessor with 128K bytes of random-access memory, two 800K-byte, 5¼-in. floppy disk drives, CRT screen, detachable keyboard and MS-DOS, is priced at $4,395. Further details are available from Durango at 3003 N. First St., San Jose, Calif. 95134.

Plus 80 Prices Get Reduced

PARSIPPANY, N.J. — MDS Trivex, a division of Mohawk Data Sciences Co., has announced new pricing for the Plus 80 family of IBM 3278 plug-compatible devices.

The purchase price of the vendor's 8074-1C controller has been reduced to $4,950, representing a savings of 60%. The 8078-02 large character display and keyboard is now priced at $1,500, the vendor said. The 8087-02 180 char./sec printer now costs $4,500. Monthly lease prices have also been lowered, according to the vendor.

Further details on price cuts can be obtained from MDS headquarters at Seven Century Drive, Parsippany, N.J. 07054.

Printer Out For Versator

MENLO PARK, Calif. — Centurion Industries, Inc. has announced a serial dot-matrix line printer for use with the Versator Educational Computer.

Versaprinter is said to provide hard-copy printouts of student scores and diagnostic information transmitted from Versator. It is also said to incorporate a network distribution center permitting up to ten Versators to be networked for group learning or testing purposes when each Versator contains the same software.

The Versaprinter is priced at $419. More information is available from the vendor, which is located at 167 Constitution Drive, Menlo Park, Calif. 94025.

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THIS ISN'T THE END OF THE LINE. Courses under development for availability in 1984 include: RAMIS, Mark IV/Answer 2, Structured COBOL, Systems Development, MVS/SP JCL and MVS JES2. Over 175 courses will be offered.

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Microfilm Speeds Up Employment Claims

(Continued from Page 117)
Petty said. "Microfilm files, however, can be organized and coded for retrieval in a number of creative ways. This flexibility allows more users to take advantage of microfilm to obtain the information they need to do their jobs."

Petty explained how unemployment benefit claims records were frequently misfiled by the department. Now all records are always available for instant access.

Tax reports in the tax division are also microfilmed, enabling rapid retrieval of any document image among the 140,000 filmed each quarter, he said.

"We were experiencing increasing problems with lack of space for new files, lengthy lookup times and poor file integrity," remarked Tax Records Manager Gary Hughes. "With hundreds of thousands of documents on open shelves, misfiles meant that 100 or more documents were lost each month."

Thus the department purchased three Kodak Oracle microfilmers and three Kodak Oracle microimage terminals in August 1979.

"We like the capability of devising our own coding for image retrieval," Hughes commented. "The Oracle equipment allowed us to design a system that would require only the amount of sorting we felt was desirable prior to microfilming."

Hughes is pleased that his operators all exceed the normal standards for input speeds on the Oracle microfilmers by a "healthy margin." During the average daily eight-hour shift, each of the three microfilmers microfilms between 7,000 and 8,000 documents. The department could convert more files to microfilm without additional investment, Hughes added, by simply expanding the current single microfilming shift to a two- or three-shift operation.

Another benefit of the system has been improved circulation resulting from the elimination of the old paper-laden filing shelves, Hughes asserted.

"We're able to staff much more efficiently," Petty added. "Before, we had to add many temporary employees to meet the quarterly peaks in work load."

Now, Petty concluded, documents are always in file and readily available for access.

Convergent Unveils Megaframe System

(Continued from Page 117)
own copy of operating system software. A given processor handles one of four specialized functions:

- The applications processor runs all applications programs under a virtual memory version of Unix. Up to 16 such processors can be installed, making possible performance of 8 million instructions per second.
- The file processor, functionally equivalent to a back-end data base processor, is devoted to executing the file system and file-oriented programs. It also handles disk access requests from other processors and controls up to four Winchester storage devices: three 5¼-in., 50M-byte drives and a removable 5M-byte cartridge in the master enclosure, as well as four more drives in each expansion enclosure.
- The cluster processor, which acts as a front-end communications processor, controls two multidrop RS-422 ports and can transmit at 307K bit/sec. It also supports three RS-232 ports and a parallel printer port.
- The terminal processor also acts like a front-end communications processor and has 10 serial RS-232 lines each operating at up to 19.2K bit/sec. It can support any device with a standard RS-232 interface.

Both the terminal and cluster processors support a variety of communications protocols including IBM's System Network Architecture, 3270, X.25, bisynchronous 3270 and 2780/3780.

Three of the four processor types — the file, cluster and terminal processors — run the Ctos operating system. The applications processor runs under Unix and is based on the 10 MHz Motorola 68010 virtual memory processor.

Megaframe, in its basic single-enclosure configuration for eight users, with 1M byte of error-correcting RAM, one file, application and cluster processor, one 50M-byte Winchester disk, one 50M-byte removable Winchester cartridge and one PT terminal is priced at $17,546. It will be available in August.

Convergent Technologies is located at 3055 Patrick Henry Drive, Santa Clara, Calif. 95051.

Micro Combo Introduced

NEWTON, Mass. — Cyborg Corp. has recently developed a microcomputer that is said to combine an on-board Motorola, Inc. 68000 microprocessor with several characteristics of the IBM Personal Computer.

The resulting Isaac 2000 system reportedly performs rapid data acquisition and boasts a large memory and true multitasking capabilities. It supports two RS-232 ports and one IEEE-488 interface. The Isaac 2000 is priced at $4,100, Cyborg said from 55 Chapel St., Newton, Mass. 02158.

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5" DSDD Soft Sector (Unformatted)	F14A	2.99
8" DSDD Soft Sector (256 B/S, 26 Sectors)	F144	2.99
5" DSDD Soft Sector (512 B/S, 18 Sectors)	F145	2.99
5" DSDD Soft Sector (1024 B/S, 8 Sectors)	F147	2.99
5¼" SSSD Soft Sector w/Hub Ring	M11A	1.49
5¼" Same as above, but bulk pack w/o envelope	M11AB	1.29
5¼" SSSD 10 Hard Sector w/Hub Ring	M41A	1.49
5¼" SSSD 18 Hard Sector w/Hub Ring	M51A	1.49
5¼" SSDD Soft Sector w/Hub Ring	M13A	1.79
5¼" Same as above, but bulk pack w/o envelope	M13AB	1.59
5¼" SSDD 10 Hard Sector w/Hub Ring	M43A	1.79
5¼" SSDD 15 Hard Sector w/Hub Ring	M53A	1.79
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5¼" DSDD 18 Hard Sector w/Hub Ring	M54A	2.69
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Programmable Controller Takes to Factory Floor

(Continued from Page 117)
other set of wires hooking it up to a control panel.

The control panel provides the interface between a human operator and the controller. Like the controller, the panel is a custom-made, hard-wired piece of equipment. Through a series of lights and switches embedded in the panel, an operator can monitor and control what is happening to the machine or process.

This format has a number of serious limitations. The electromechanical controller is dedicated to one set of functions only. Expensive and laborious rewiring is required in the controller, control panel or both every time a change is needed in machine operations. Such controllers cannot communicate with each other, receive data or inquiries from computers or generate documentation on the status of the machine. When something goes wrong, it may not be easy to detect whether the problem lies in the machine, the control system or the masses of wires that tie them together.

For these reasons, manufacturers in the past decade have been looking to the controller on a chip for greater programming flexibility, adaptability, speed, ease of use and reliability under varying conditions.

The programmable controller is a solid-state device, not electromechanical, and consists of several components. Input ports or registers indicate the status of machine or process operations, while output registers carry signals needed to direct the machine. A CPU scans the input data on machine status in relation to the initiation of appropriate output signals. The CPU is itself directed by instructions encoded in nonvolatile memory.

Like an electromechanical controller, the programmable controller is event-driven and may be programmed using the ladder diagram format. In effect, the physical parts that were used to carry out timing, counting, sequencing and other functions have been electronically replaced by the memory residing in it. An operator can enter the required logic functions into the programmable controller memory using a keyboard based on the familiar symbols of these functions.

The continuing use of ladder logic with programmable controllers is due more to cultural considerations than to technological constraints. User-resistance and retraining among electricians and technicians can be reduced when they are confronted with devices that mimic formats with which they are already comfortable.

The fundamental advantage of a programmable controller is that, unlike a relay controller, only one type of equipment is needed for any given machine. When a sequence or process change is needed, this may be accomplished solely by altering the device's program without tearing down and restructuring the controller and its complex of external wires. This makes for associated cost savings in assembly, inventory, maintenance and pretesting of control designs.

The programmable controller is competing not only with the older controller but with general-purpose computers as well. With more memory and the use of higher level programming languages than those available to the average programmable controller, the general computer can undertake a correspondingly greater and more versatile array of machine monitoring and communications functions.

The computer, however, has its own limitations as well. Compared with the programmable controller, it has not been designed for the temperature, noise and humidity conditions that can prevail on the factory floor. Also, operating the computer usually requires a higher level of education than that needed to run or maintain a programmable controller.

The programmable controller control panel has remained relatively unchanged from the time of its predecessor.

Livingston is with State Street Consultants, Inc. in Boston.

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For example, other color projection systems have three external lenses that must be separately [illegible] adjusted to

Advanced Digital Unwraps Z80-Based Micro

GARDEN GROVE, Calif. — Advanced Digital Corp. has announced the Super-System, a S-100 microcomputer based on the Zilog, Inc. Z80 microprocessor.

The Super-System employs a master/slave architecture that gives each user a dedicated Z80 microprocessor. A large number of users can be linked to the system without experiencing a degradation in performance, a vendor spokesman claimed.

A base system includes a Z80A microprocessor, 64K bytes of main memory, 2K or 4K bytes of erasable programmable read-only memory (Eprom), a 5¼-in. or 8-in. floppy disk drive, two serial and two parallel I/O ports and a real-time clock. A base system, including a power supply and chassis, an eight-slot motherboard and Digital Research, Inc.'s CP/M operating system, costs $2,675.

A slave processor, which includes a dedicated microprocessor, four serial and two parallel interface ports, between 2K and 4K bytes of Eprom, between 64K and 128K bytes of random-access memory, costs $650, the vendor said from 12700-B Knott Ave., Garden Grove, Calif. 92641.

Additions for Certainty Unveiled

MINNEAPOLIS — Control Data Corp. has unveiled two additions to its Certainty Series fixed disk system line used with the IBM Series/1 minicomputers.

These products, the Certainty 231 and 241, are said to provide double the maximum storage capacity of previous units at a 30% increase in price. The fixed disk drives provide either 63.2M or 126.4M bytes of sealed modules random-access data storage, a vendor spokesman said.

At the same time, the vendor announced replacements for its current line of 63.2M-byte models of Certainty 230 and 240 Series MMD disk storage systems. These models can reportedly be field-upgraded to 126.4M bytes for $3,500, according to the vendor spokesman.

Prices for the Certainty 231 and 241 disk systems range from $12,325 to $19,200 in quantities of five through nine, the vendor said through Box O, Minneapolis, Minn. 55440.

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Controller, Disk Unit Fit IBM Micro

SCOTTS VALLEY, Calif. — Mountain Computer, Inc. has announced a hard disk interface/controller and a half-height hard disk subsystem for IBM's Personal Computer.

The controller reportedly allows IBM Personal Computer users to upgrade to the newly announced IBM XT microcomputer at about half the cost of the IBM expansion chassis, according to a spokesman for the vendor.

In addition, the device allows current XT users to add extra disk drives to their systems, the vendor spokesman said.

The Mountain Computer controller is compatible with the Microsoft, Inc. MS-DOS Release 2.0 operating system and costs $450, the vendor said.

The firm also announced a half-height Winchester hard disk subsystem for use with IBM Personal Computers and microcomputers developed by Apple Computer, Inc.

Called the Mountain Space Saver, the device offers up to 5M bytes of storage, according to the spokesman.

The Mountain Space Saver costs $995 without a controller, and a cartridge disk subsystem costs $1,325 without a controller, the vendor spokesman said.

More information is available from the vendor, which is located at 300 El Pueblo Road, Scotts Valley, Calif. 95066.

NCR Unveils Film Cassette

DAYTON, Ohio — NCR Corp. has unveiled a large-size film cassette option and a 10M-byte disk for its 5300 series of computer output microfiche (COM) recorder systems. At the same time, the company announced a high-speed autoload microfiche duplicator that reportedly uses software-generated bar codes to communicate.

The film cassette, called Series 53, is said to hold 500 feet of silver halide film, which will produce 1,000 microfiche. The disk drive consists of one fixed 5M-byte disk and one removable 5M-byte disk, according to a vendor spokesman. The 4207-AL automatic fiche duplicator attaches directly to NCR's 5300 COM recorder for duplication purposes and costs $44,000.

Further details may be obtained from NCR headquarters in Dayton, Ohio 45479.

Comark Offers Tape Controller For Pertec Drives

WALTHAM, Mass. — A magnetic tape controller with direct memory access control has been unveiled here by Comark Corp.

The MT 86 is a multibus resident ½-in. magnetic tape interface to industry standard reel-to-reel Pertec Computer Corp.-compatible tape drives, the vendor said. It reportedly provides for 16 different tape operations, 11 registers, one interrupt and three error/status checks and supports both 7- and 9-track drives.

The price of this device is $1,295. Comark can be contacted at 257 Crescent St., Waltham, Mass. 02154.

Tape System Fits IBM System/34

CENTERPORT, N.Y. — General Systems Center, Inc. has announced an addition to its line of magnetic tape systems that are compatible with IBM's System/34 and Personal Computer.

The magnetic tape systems reportedly include software to operate the system and offer applications including IBM bisynchronous tape communication, medical insurance reporting, insurance company data exchange, service bureau applications, mainframe data transfer and banking/brokerage data to microfiche.

The system costs under $10,000 through P.O. Box 416, 95 Centershore Road, Centerport, N.Y. 11721.

Disk Subsystem Out For Hewlett-Packard

SAN JOSE, Calif. — Bering Industries, Inc. has announced a high-capacity 5¼-in. Winchester disk subsystem for use with Hewlett-Packard Co. computers.

Each Bering 4895-11 and 4895-21 reportedly provides 15.5M bytes of formatted Winchester disk storage, with an optional 1.2M-byte 8-in. floppy disk drive in the same enclosure. The average data transfer rate with these subsystems is 164K byte/sec, according to the vendor.

Prices of the 4895 series range from $3290 to $6,990. Further details may be obtained from the vendor at 747 E. Brokaw Road, San Jose, Calif. 95112.

Computer-Aided Drafting Announced by Andromeda

CANOGA PARK, Calif. — A computer-aided drafting system (Cads) has been announced here by Andromeda Systems, Inc.

The A-Cads/1 system incorporates a Digital Equipment Corp. LSI-11/23 CPU, 64K-byte random-access memory, five serial RS-232C ports, a CRT, a floppy and Winchester controller, a joystick interface and several expansion slots, according to a spokesman for the vendor.

The system is aimed at users who are not necessarily computer experts and offers a range of Help features in addition to graphics, project scheduling, client billing and other software functions.

The A-Cads/1 is available for $24,000 from Andromeda Systems at 9000 Eton Ave., Canoga Park, Calif. 91304.

Multifunction Desktop Unveiled

COSTA MESA, Calif. — A multiuser multifunction desktop computer system has been unveiled here by Microtech Business Systems, Inc.

The M1 Series Desktop Computer is designed for first-time users, according to the vendor. Capable of handling up to five users, the M1 Series reportedly features a high-speed 16-bit microprocessor with 128K bytes of random-access memory. It is presently available in three models: the M1/10, M1/34 and the M1/68, with 10M bytes, 34M bytes and 68M bytes of Winchester disk storage capacity, respectively.

All models include a 20M-byte, ¼-in. streaming tape drive, the Iris or Bits operating system and five serial ports. Pricing starts at $12,000. Microtech is based at 3180 Pullman St., Costa Mesa, Calif. 92626.

For IBM Personal Computer

Voice Synthesis Board Out

CLEVELAND — Tecmar, Inc. h. announced the PC-Mate 5peech Ma ter, a voice synthesis board for IBM's Personal Computer.

PC-Mate provides synthetic voice output, text-to-speech conversion and an optional unit that expands the unit's vocabulary. The board offers two utility programs: English, which provides a software base for speech-to-text conversion, and 5peak, which assigns function keys for several operational modes, the vendor said.

The PC-Mate 5peech Master board costs $395. The 5peech-Master software support package costs $95 and a 5peech Master Auxiliary Vocabulary Unit costs $100, the vendor said from 23600 Mercantile Road, Cleveland, Ohio 44122.

Comfiler Fits Epson QX-10

TORRANCE, Calif. — A 5¼-in. Winchester disk drive has been introduced here by Comrex International, Inc., which reportedly offers Epson America, Inc.'s QX-10 computer users 10M bytes of fast-access storage capacity.

With Comfiler, users of the Epson QX-10 can boost their volume of word processing, scheduling, filing, graphics, electronic mail and other functions, according to Comrex. The disk drive is said to feature capacity to 10M bytes of formatted or 12.8M bytes of unformatted memory. It is also compatible with the Digital Research, Inc. CP/M 2.2 operating system, as well as the Epson operating system software.

This product is priced at $2,295, the vendor said from 3701 Skypark Drive, Torrance, Calif. 90505.

Family of High-Speed Line Printers Announced by Southern Systems

FORT LAUDERDALE, Fla. — A family of high-speed line printers has been introduced here by Southern Systems, Inc.

Available in 1,500 to 2,000 line/min speeds, the printers come complete with interfacing, controllers and cabling to hook up with IBM, Digital Equipment Corp., Data General Corp., Perkin-Elmer Corp., Centronics Data Computer Corp., Texas Instruments, Inc., Burroughs Corp. and other systems, the vendor said.

Priced from $21,000, the printers are available from Southern 5ystems at 2841 Cypress Creek Road, Fort Lauderdale, Fla. 33309.

Turnkey Targets Manufacturers Running Pick

BELLEVUE, Wash. — Integram, Inc. has announced that it will make available a turnkey computer manufacturing system designed for use by small to mid-size manufacturers.

The integrated system, known as Integram System/Manufacturing, is designed to run under Pick & Associates, Inc.'s Pick operating system software. It is command-driven and provides access to nontechnical users, according to a spokesman for the vendor.

Some of its features include engineering functions, sales order entry capability, inventory control, purchase order control, shop floor control, materials requirement planning/master scheduling and forecasting and costing, the vendor said.

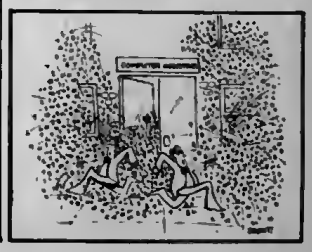
5ystems are typically priced in the range of $40,000 to $80,000, the vendor said from 1150 140th Ave. N.E., Bellevue, Wash. 98005.

Prices Slashed On MPC 1600s

COLUMBIA, Md. — Columbia Data Products, Inc., in response to IBM's latest round of price cuts, has announced price cuts on two IBM Personal Computer-compatible, 16-bit microprocessors, the MPC 1600-1 and the MPC 1600-4.

Effective immediately, the MPC 1600-1 single-board 8088 processor will be reduced from $3,995 to $3,395. The MPC 1600-4, which reportedly offers greater storage capacity than the former processor, will now sell for $4,995, down from $5,995.

Further details may be obtained from the vendor at 8990 Route 108, Columbia, Md. 21045.



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Quantex Unveils Matrix Printer

HAUPPAUGE, N.Y.. — The Quantex Division of North Atlantic Industries, Inc. has announced a multiple-speed printer for letter-quality and word processing applications called the Model 7040.

Compatible with Diablo Systems, Inc. Model 630, the matrix printer is capable of generating graphics and has a single-sheet feed capability, a spokesman noted.

The unit can be used with any word processing or graphics system that can use a Diablo 630 daisywheel printer. The Model 7040 costs $2,195, the vendor said from 60 Plant Ave., Hauppauge, N.Y. 11788.

Conver Unwraps AC100 Series Of Switching Power Supplies

CUPERTINO, Calif. — Conver Corp. has recently unveiled its AC100 series of 100W, multiple-output switching power supplies.

These products are designed for systems using 5¼-in. or 8-in. Winchester or floppy disk drives and can reportedly provide up to 150W peak power.

The base price for a single AC100 unit is $200, the vendor said from 10629 Bandley Drive, Cupertino, Calif. 95014.

Fastcard Fits Apples, Speeds Performance

SANTA CLARA, Calif. — Synertek, Inc. has announced the Fastcard, a performance enhancement board for Apple Computer, Inc. Apple II and Apple II+ microcomputers.

The device reportedly gives Apple users the capability of executing programs at more than three times their normal speed while providing all the functions of a random-access memory (RAM) card, the vendor said.

The Fastcard contains 16K bytes of RAM and a Commodore Business Machines, Inc.'s 6502 microprocessor. A 5¼-in. floppy disk drive is also provided, the vendor said.

The Fastcard costs $299.95, the vendor said from 3001 Stender Way, MS-34, Santa Clara, Calif. 95054.

Storage Units Introduced By Sysgen

FREMONT, Calif. — Two hard disk mass storage memories for the IBM Personal Computer have been unveiled here by Sysgen, Inc.

The two Winchester-type devices feature high-speed streaming tape cassette back-up and provide formatted storage of 10M bytes (Model II-10) or 20M bytes (Model II-20), the vendor said. The products are said to operate under either IBM's PC-DOS or Digital Research, Inc.'s CP/M 86 operating system software.

Suggested retail price for the Sysgen II-10 is $2,995, and the Sysgen II-20 costs $3,795. Further details are available from the vendor at 47853 Warm Springs Blvd., Fremont, Calif. 94539.

Floppy Unit Runs on DEC

PLACENTIA, Calif. — Micro Technology, Inc. has announced a 22-bit Q-bus 8-in. floppy controller compatible with Digital Equipment Corp.'s LSI-11 computers.

The MXV22 reportedly controls up to four disk drives with up to 1M byte of formatted data per drive.

The product is available for $990 from Micro Technology at 1620 Miraloma Ave., Placentia, Calif. 92670.

IBM Micro Gets Expansion Board

LOGANSPORT, Ind. — Memory Technologies, Inc. has introduced a modular multifunction expansion board for the IBM Personal Computer, the IBM Personal Computer XT and plug-compatible systems.

The Versa-RAM Plus II board is said to allow the addition of up to 512K bytes of random-access memory.

It costs $475 from 4343 Grand Prix Dive, Logansport, Ind. 46947.

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Bits & Pieces

Streaming Cassette Backup Designed for IBM XT Micro

FREMONT, Calif. — A streaming cassette tape backup for IBM's XT hard disk version of its Personal Computer has been introduced here by Sysgen, Inc.

The Sysgen Image backup subsystem reportedly includes controller, drive electronics and tape drive. It is said to be software compatible with either IBM's PC-DOS or Digital Research, Inc.'s CP/M 86 operating system software.

Storage capacity of the streaming tape cassette in the Sysgen Image is 20M bytes, according to a vendor spokesman.

Priced at $995, the Sysgen Image is available from Sysgen, located at 47853 Warm Springs Blvd., Fremont, Calif. 94539.

Copy Service Announced To Verify Floppy Diskettes

BRICKTOWN, N.J. — User Friendly East, Inc. (UFE) has announced the formation of a floppy diskette duplication service to copy and verify flexible disk information.

Additional services include: preformatted and certified diskettes in a variety of formats, serialization for duplicated diskettes, piracy prevention and archival and secure storage for master diskettes, according to the vendor.

The average price is $2.30/disk for 1,000 ordered. More information is available through UFE at Box U, Bricktown, N.J. 08723.

Two Storage Spoolers Unveiled by Consolink

LONGMONT, Colo. — Consolink Corp. has introduced two standalone intermediate storage spoolers which incorporate microprocessors.

The Microspooler buffer/interface can receive data from any transmitted source and can be used as a separate data collection device, a spokesman said. It can also be used as a stacker/mixer. Selection can be made of sentences, paragraphs, data tables or graphics from different programs and stacked in memory in any order.

The product provides an interface between noncompatible computers and printers, can produce up to 99 copies, includes a pause button and offers single-sheet feeding. Buffer status readout gives a continuous update of the amount of memory in use, the spokesman said. It also indicates how much data is yet to be printed. The basic unit contains 16K bytes of memory, expandable to 64K bytes and costs $199 for the parallel-to-parallel interface unit.

Superspooler includes basic features of Microspooler. Other features include pagination/formatting, space compression, page heading and hard and soft reset buttons. The basic unit includes 16K bytes of memory. Optional features include two additional ports, one serial input and one serial output and memory expansion up to 62K bytes. The base price is $349, with the memory expansion option priced at $159 and serial option priced at $95.

Both products are available from Consolink at 1840 Industrial Circle, Longmont, Colo. 80501.

QDP Computer Systems Offers Pair of RAM Disks

CLEVELAND — Two additional random-access memory RAM disks, available in either a 256K-byte or 512K-byte configuration, have been introduced here by QDP Computer Systems.

These memory boards reportedly program the QDP microcomputer system to access the memory as if it were a disk, enhancing the machines throughput, according to the vendor.

They cost $945 and $1,495, respectively, the vendor said from 10330 Brecksville Road, Cleveland, Ohio 44141.

Adapter Interface Board Fits IBM's Personal Computer

ELK GROVE VILLAGE, Ill. — Amdek Corp. has announced a Multiple Adapter Interface board for IBM's personal computers.

The unit features 128K bytes of dynamic random-access memory and a two-position switch which allows the user to select between monochrome video display or color graphics applications. The board allows access to the display memory at any time, providing interference-free performance while screen editing is processing at full speed, the vendor said.

The board costs $799, the vendor said from 2201 Lively Blvd., Elk Grove Village, Ill. 60007.

Series of Power Systems Out for Minicomputers

ANAHEIM, Calif. — General Power Systems has announced the GPS-2K series of on-line uninterruptible power systems for minicomputers.

The GPS-2K can operate from a 120Vac 60 Hz utility power line with backup provided by sealed batteries. Options include a static switch for communications with RS-232 devices, additional batteries, rack or standard enclosures and various input voltage and frequencies.

The GPS-2K costs from $3,950, including batteries capable of sustaining a full-rated load for at least 10 minutes, the vendor said from 1400 N. Baxter St., Anaheim, Calif. 92806.

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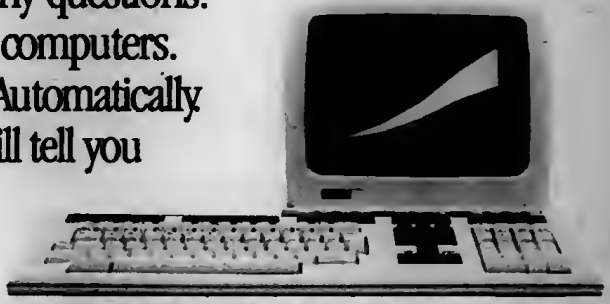

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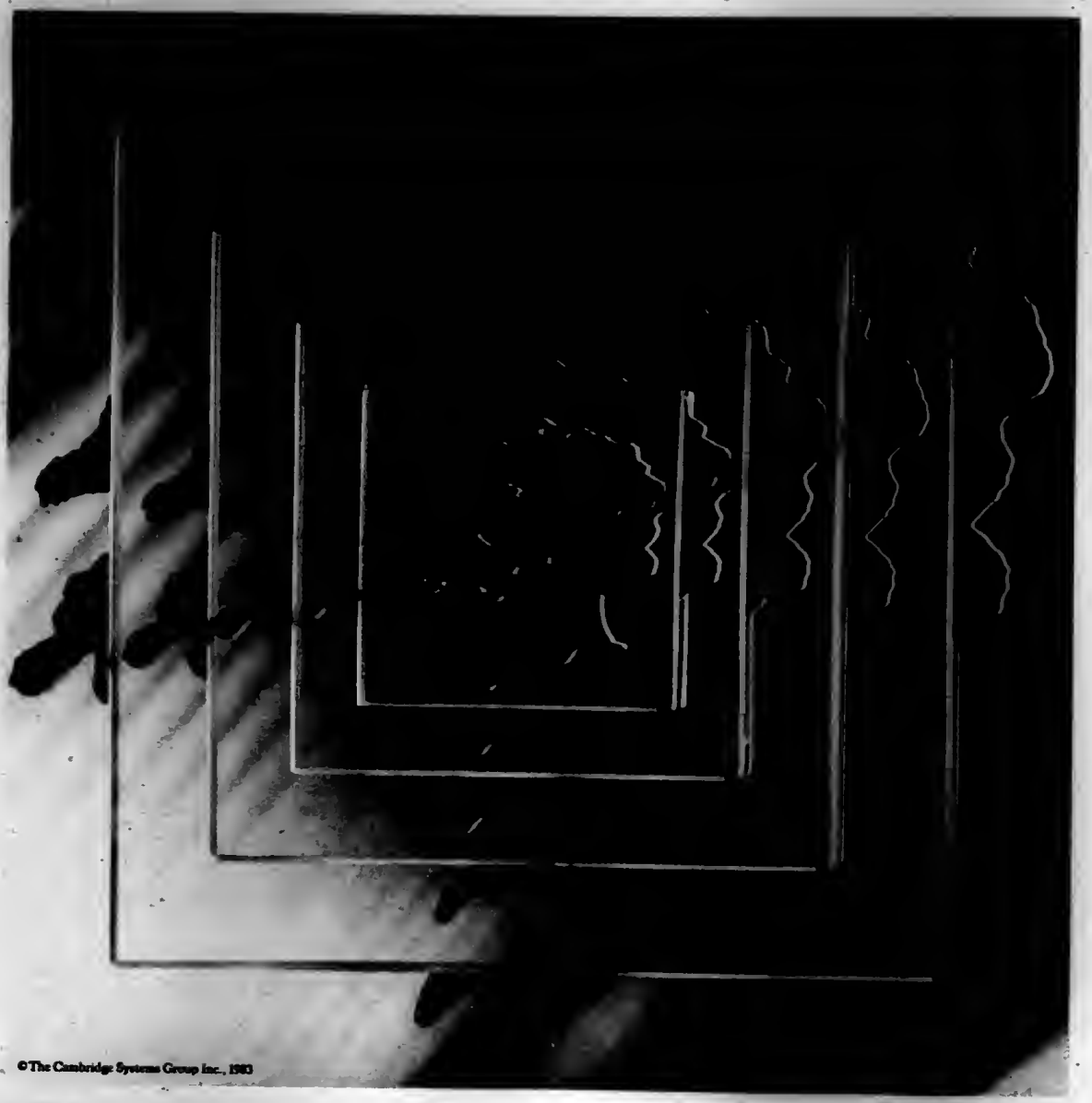

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ACF2 is developed by SKK, Inc., Rosemont, Illinois

Separates Decision Support, Presentation Graphics

Graphics Software Mart on the Rise: IDC

By Bruce Hoard
CW Staff

FRAMINGHAM, Mass. — Business graphics can be divided into decision support graphics and presentation graphics, according to a recent report from International Data Corp. (IDC).

"Graphics in the Electronic Office Environment" states that while there is some overlapping between the two, decision support graphics can be thought of as the graphics representation of data to aid in its analysis. Presentation graphics are used in more formal settings for the presentation of the results of analysis.

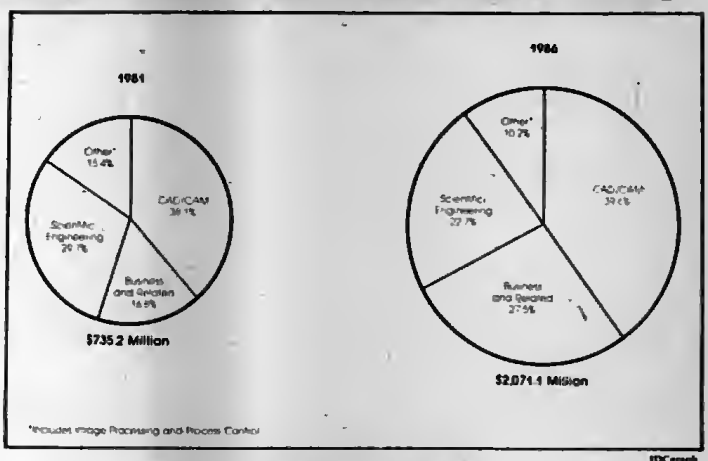
The study goes on to say that anyone in an information processing role in the office environment is a potential user of business graphics and penetration of that large market has hardly begun.

"Graphics software is one of the fastest growing segments of the general software marketplace, with a compound annual growth rate [1980-1986] of 56.6%," IDC said. Until recently, graphics software was restricted to mainframes and minis because of the size and processing demands of the application. Mainframe business graphics software is still a major marketplace, with offerings from IBM and other hardware manufacturers, as well as independents like Integrated Software Systems Co. and Precision Visuals, Inc.

Graphics software for desktop computers is also a fast-growing segment of the market, with many new packages having been introduced in the last year or two and more expected, the study said.

"The business graphics market actually consists of segments of various different markets, principally terminals and printers," the report noted. "Taken as a whole, the market is expected to grow at a compound rate of 35.7% from 1981-1986."

In the business graphics hardware area, the report discusses vendors and products in three categories: graphics workstations, hard-copy output devices and cameras.



U.S. Graphics Peripherals Market

Turning to integrated office graphics systems, the study notes there are many ways to offer graphics in the context of integrated office systems. They range from making available third-party graphics software to full-blown vendor-developed software and graphics output hardware.

"While the major part of the business graphics market is accounted for by hardware and software sold to end users, there is still a significant service bureau market," the study noted.

The nature of the business varies from bureau to bureau, but a general model is for an end user to submit data, either in hard copy for rekeying or via direct communications. The service bureau then processes the data and produces a graph of specified format, which is then turned into a slide, transparency or print that is shipped back to the end user.

Graphics systems should be user-friendly, able to be integrated with organizational data bases and offer high-quality, high-resolution output.

What the report refers to as "graphics education" is also important. Because most office workers have never been able to use graphics extensively, they are not trained to think in terms of what makes an effective graph. There is a tendency to pack in more data than can be comprehended and to rely on a particular format because it is familiar, not because it is the appropriate one for the information.

The 47-page study is available for $2,500 from IDC, Five Speen St., Framingham, Mass. 01701.

Electronic Mail Package Targets Prime Systems Running Primos

DETROIT — Creative Industries of Detroit, Inc. has introduced an electronic mail package for Prime Computer, Inc. computers running the Primos operating system.

CID Mail offers individual mailboxes the capability to send a letter to multiple users with one command, on-line documentation of all commands and the ability to mail binary files. Return receipt, letter labeling and a mail user directory are also provided, a vendor spokesman said.

Additional features allow letter transfers between networked Prime computers and letter encryption.

The package is available for $2,400 for a single CPU license and is available from Creative Industries of Detroit, 3080 E. Outer Drive, Detroit, Mich. 48234.

Executive Mouse Runs on Micros

REDWOOD CITY, Calif. — Product Associates, Inc. has announced the Executive Mouse, which can be used on most popular microcomputer systems.

The unit is completely contained and interfaces with a microcomputer as a supplementary keyboard.

The Executive Mouse is programmable and can be used with most software programs and microcomputers, as well as larger processors, the vendor spokesman said.

The unit is located between the CRT terminal and host processor, and cursor-control codes are automatically sent to the processor as the mouse moves. The unit also has three switches that are programmed to send delete character, delete word and perform special command functions, the vendor said.

The Executive Mouse costs $395 from the vendor at 465 Convention Way, Redwood City, Calif. 94063.

Northern Telecom Upgrades PBX

RICHARDSON, Texas — Northern Telecom, Inc. has introduced a new configuration of its SL-1M digital business communications system.

The SL-1M Executive Package is a private branch exchange (PBX) equipped with 40 SL-1 electronic telephone sets. The system was designed to meet the needs of the small and medium-size business market, especially companies with a large percentage of professionals such as legal firms and small banking outlets.

The price of the 40-line Executive Package is $25,348 or $634/line. The price varies depending on the choice of additional options. More information is available from Northern Telecom, 1001 E. Aparaho Road, Richardson, Texas 75081.

Gateway Link Eases OA Entry

NEWPORT BEACH, Calif. — Computer Development, Inc. has introduced a gateway link designed for multitasking, multiterminal, shared-resource access between computers with dissimilar protocols.

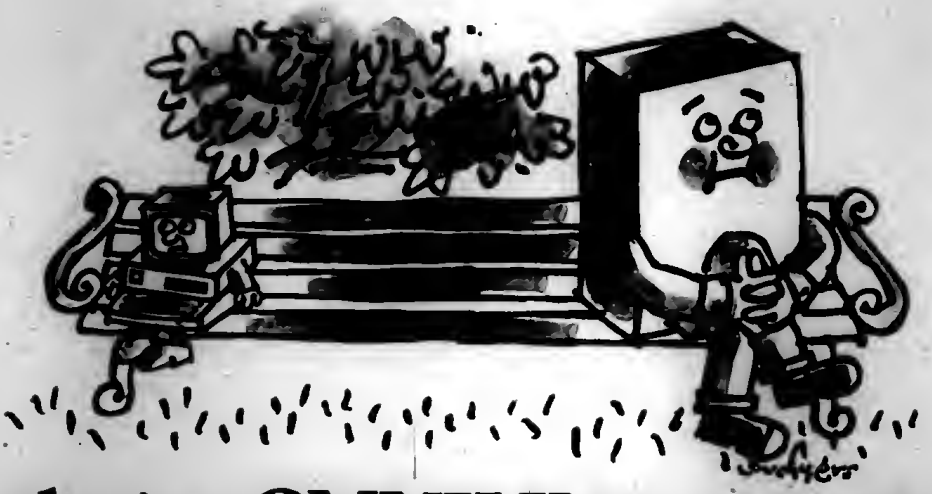
The link is said to allow easier entrance into office automation through electronic mail.

The Executive Telecommunications Controller 140 is a microprocessor-controlled, 103/202-compatible, autodial/autoanswer communicstions center with four terminal ports that can be configured for any CPU.

This is said to allow the connected terminals to access an intelligent modem, printer control buffer and other communications devices, according to a vendor spokesman for the firm.

The Executive Telecommunications Controller 140 is available for $1,595.

Computer Development is located at 151 Shipyard Way, Berth C, Cabin 2, Newport Beach, Calif. 92663.



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WP System Monitors Purchases for Light Firm

By Robert Batt
CW West Coast Bureau

MORRISTOWN, N.J. — In supplying the electricity needs of its 700,000 customers, the Jersey Central Power and Light Co. (JCP&L) recognized a need to converge its text and data processing requirements.

Nowhere was this more apparent than in the company's purchasing department, which for many years survived with a cumbersome and labor-intensive floppy disk storage and retrieval system.

By the late '70s, this system had become so saturated that the output of timely information became impossible.

Search Begins

The company began to look around for a word processing system that would fit its requirements, which included the processing of a purchase requisition from the time of its receipt in the purchasing department to receipt of the needed goods and services.

Such a system needed to be on-line from the time of the initial entry of the purchase requisition into the system file. Ideally, pertinent data would be captured only once, retained and then perpetuated by the system. Data such as vendor names and addresses and purchase descriptions for inventory material would be permanently stored and retrievable for use.

JCP&L also wanted the system to be able to retrieve pertinent data for management in both fixed and variable report formats.

Data processing executives listed their requirements for the intended system. These included:

- 60M bytes of both on-line and backup storage.
- Sorting and security capabilities.
- Eight workstations that could be expanded when needed.
- Communications capability with the company's IBM 3081 mainframe computer.

After a six-month search, the company opted for a Wang Laboratories, Inc. OIS 140 Model 3 system. According to company officials, Wang software weighed heavily in the selection process. The glossary, list processing and basic language packages, they claimed, were especially pertinent to JCP&L's planned use of the equipment.

The Wang system is now being used by JCP&L to monitor its minority business procurement program, among others. Each purchase order awarded to a minority supplier is coded, and a track is kept of how many dollars have been awarded to minority businesses and when the awards were made.

Other functions on the Wang system include requisition generation, creation of requests for quotations printing official purchase orders, a vendor history file, a dollar commitment register and a program that monitors buyer work loads and indicates how many purchases and dollars are being handled by each buyer.

According to Clement DuFresne, vice-president for materials and services, this latter program enables the purchasing department to monitor continually and manage its work load.

"The system met my time frames for on-line productivity. This was all the more remarkable when you consider that we initially had no trained personnel. Today we can take someone with no prior skill and turn him into a real pro in a month or less," he said.

The OIS 140 has been upgraded to an OIS System 145, and its use has spread to other departments within the company. The Legal and Human Resources Department has now purchased its own system.

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SCAN/370 — The system that automatically simulates the execution of every cleanly compiled COBOL program. SCAN/370 gives you critical analysis information that reveals how each program will execute at run time— information not obtainable via cross referencers, flowcharters, or other analysis tools.

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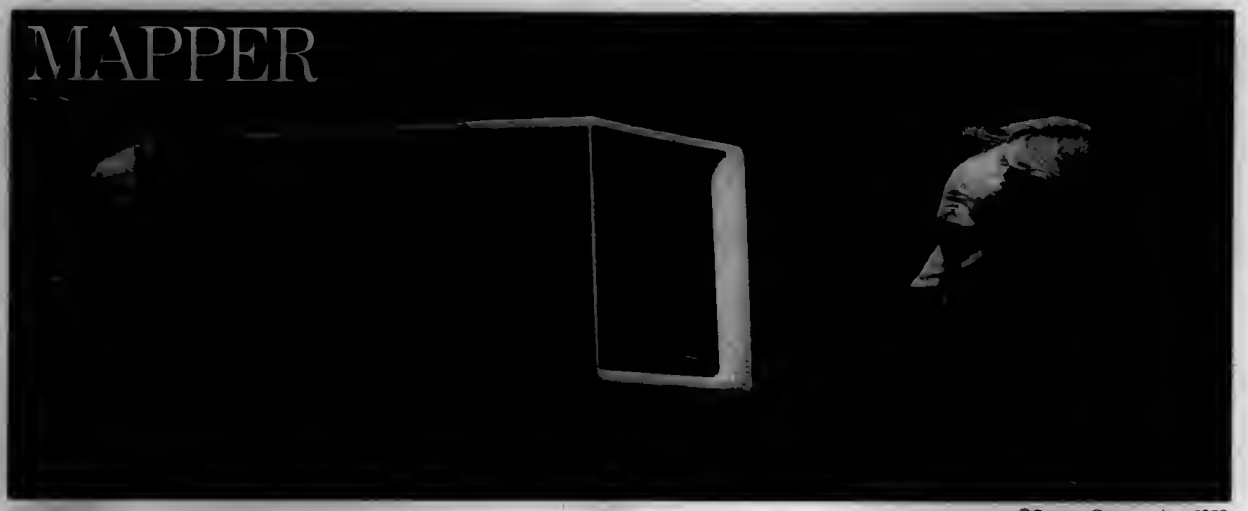

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CW Photo by L. Paul

James E. Grinnell

DMS' Strategy: New Packaging Yields Customers

By Lois Paul
CW Staff

LEXINGTON, Mass. — James E. Grinnell seems uniquely qualified to serve as president of Distribution Management Systems, Inc. (DMS), a company that provides turnkey systems and software for managing distribution and warehouse functions.

Until last December, he was vice-president and general manager of Polaroid Corp.'s worldwide distribution division, with overall responsibility for 240 people. In addition, he was a user of the DMS-1000 Distribution Management System. As such, Grinnell had experienced the contest that often arises between sales and manufacturing when a company is determining how many

(Continued on Page 140)

IBM Seizes Second Place In CAD/CAM Revenues

By Ed Scannell
CW Staff

RYE BROOK, N.Y. — By providing users of turnkey computer-aided design and manufacturing (CAD/CAM) systems with sophisticated software upgrades over the past three years, IBM has quietly slipped past Applicon, Inc., Calma Co. and Autotrol Technology Corp. and into second place behind Computervision Corp. in total CAD/CAM revenues.

From 1980 through 1982, IBM's CAD/CAM revenues rose from $40 million or 12% of the market to $225 million and a 20% market share, according to Merrill, Lynch, Pierce, Fenner and Smith, Inc. IBM is expected to increase its CAD/CAM revenues to $305 million and at least maintain its 20% share in 1983, a Merrill Lynch spokesman said.

Perhaps the most significant aspect of IBM's CAD/CAM success, particularly in the mechanical design portion of the CAD market where it owns a 35% share, is that it has only one dedicated monochrome terminal, the 3250. What has enabled the company to leapfrog past some of the heavyweight suppliers of CAD/CAM products over the past three years is its

(Continued on Page 146)

An IBM industry manager documented the company's increased commitment to the CAD/CAM market by pointing to the formation last year of a 'several-hundred-person' group within IBM that is dedicated solely to producing CAD/CAM products.

To Win High-Tech 'War' With Japan

Sen.: U.S. Must Support R&D

By Bill Laberis
CW Staff

FRAMINGHAM, Mass. — The U.S. has exhibited a "mortician's view" of industrial growth in shoring up dying industries. The Japanese, on the other hand, have employed a "sunrise" approach to industrialization that both favors its high-technology sector and threatens to destroy the U.S. economically.

This was the guts of a message delivered here recently by U.S. Sen. Paul Tsongas (D-Mass.), speaking before a group of 175 electronics industry executives at a symposium entitled "The Small Systems Economy: Crisis and Opportunity," which was sponsored by the Interface Group.

The Japanese, Tsongas said, have followed a "Darwinian" road to post-World

(Continued on Page 142)

CW Photo by B. Laberis

Sen. Paul Tsongas

Japan to Play Influential Role In Business Graphics, Exec Says

By Robert Batt
CW West Coast Bureau

SAN DIEGO, Calif— The Japanese computer industry will play a far more influential role in the future growth of business graphics than it has in the past, an industry consultant said here recently.

Carl Machover, president of Machover Associates Corp., White Plains, N.Y., said Japanese manufacturers will be particularly strong in the area of computer-aided design and manufacturing (CAD/CAM).

In an opening address to the Fifth Annual Conference on Computer Graphics '83, sponsored by Frost & Sullivan, Inc.,

(Continued on Page 154)

Coverage of Computer Graphics '83 continues on Page 155.

A
Simon Legree
for
Computers

John B[illegible] & Company, Inc.

DMS' Plan: New Packaging Yields Customers

(Continued from Page 139)

finished goods it will have available and when these can be shipped.

Before he began using the DMS distribution system, he said, salesmen at Polaroid deve'oped a forecast and gave it to manufacturing to be used as a production vehicle. "If you had back orders, it was manufacturing's fault. In high inventory, it was sales' fault," he explained.

Instead of determining "how many widgets you are going to sell" and making this the production plan, he explained, the DMS-1000 system is designed to determine what is in the distribution pipeline today and to answer such questions as, "How long does it take you to move it out to your distribution centers? How much product do you need and where are you going to warehouse it?"

Until recently, the DMS-1000 Distribution Management System and the DMS-1500 Warehouse Management System were sold as complete customized hardware/software systems based on Digital Equipment Corp.'s VAX line of minicomputers. DMS is an authorized DEC distributor, and customers can purchase their hardware through DMS or directly from DEC.

Five months ago, the firm entered a new phase, announcing that it would offer both products on a stand-alone basis for use on DEC VAX equipment. Frank Buda, senior marketing representative for DMS, said the availability of these packages has provided the firm with "more prospects than we ever had before. We see that market opening us up to companies that we weren't able to penetrate before." The lower price tag of a software-only system is allowing DMS to target its products at entry-level sites.

A further step DMS is undertaking is the conversion of its software to Cobol for use on IBM mainframes. Grinnell said he expects to have the baseline DMS-1000 product converted to Cobol by September for beta testing. "It will look the same as the product does today in terms of features and functions."

CW Photo by L. Paul

Frank Buda

Grinnell said one reason for the move to IBM equipment is that a number of potential clients have looked at the DEC-based products and said, "If you only had this kind of thing in an IBM environment it would be super." The IBM product will be targeted at the 4300 series and up, most likely running under OS with CICS. Grinnell views this as an additional flexiblity for his potential customers.

"If you want to go distributed, you would use the DEC. If you want to interface with a host with the same functionality, then you can go to the IBM," he said. "Also, it will give us the capabilty to interact directly with IBM or remotely through a mini and will look the same to the user. So as the technology changes, it will give us real flexibility to build in either direction," he added.

The seven-year-old, privately held firm has more than 140 hardware/software systems installed in 14 countries. Thirty of these customers are Fortune 1000 corporations. Company revenues increased from $1.2 million in fiscal 1977 to $10.9 million in fiscal 1981. Grinnell said growth had been about 75% per year until about 1981, when it began to flatten out. In October 1982, DMS received $2.2 million in venture capital from the Palmer Organization L.P., Fidelity Ventures Ltd., Funds for Industry, Rhode Island Hospital Trust Capital Corp., New England Capital Corp., MIT and Investor Associates.

NCR Unwraps Ethernet Rival

NEW YORK — NCR Corp. and Intel Corp. have announced a local-area networking capability that will reportedly be similar to, but less sophisticated, one-fifth as expensive and slower than Xerox Corp.'s Ethernet.

Mid-range local-area network (Mirlan) will be a 1M bit/sec baseband local-area network featuring the carrier-sense multiple access with collision detect line access method favored by the Institute of Electrical and Electronics Engineers for baseband networks.

Intel is contributing its very large-scale integration expertise by developing a semiconductor controller similar to the one used by Ethernet. NCR is working on a transceiver. An NCR spokesman claimed these products will be available "later this year."

More information is available from NCR at 1700 S. Patterson Blvd, Dayton, Ohio 45479.

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DMS Head Attributes Firm's Success to Distribution

LEXINGTON, Mass. — Explaining the success of the seven-year-old Distribution Management Systems, Inc. (DMS), which he joined last year as president, James E. Grinnell said in a recent interview, "Distribution is the jewel that really hasn't been fully discovered.

"People talk today about materials management and logistics planning. The real entry into that, we think, is through distribution back into the manufacturing end of purchasing," he explained.

"We are starting in the distribution area and generating information at sufficient enough detail to provide input to optimizing that whole logistics flow. If you can get a customer that can get the manufacturing and procurement working at exactly the same speed — the sales are working in and the resources are planned at that level — you really can be extremely profitable," he added.

Frank Buda, senior marketing representative for DMS, said that in the past 20 years there has been a lot of manufacturing software available, but not a lot of distribution software.

"One reason is that distribution, more than any other area of the business, represents the uniqueness of the business in terms of marketing strategies, products, pricing and distribution channels," he said.

According to Buda, the major competitors DMS has faced have been the in-house alternative as well as the offerings of hardware vendors. He noted that only a handful of large mainframe-based packaged solutions are available from independent software vendors.

Grinnell said that as former vice-president and general manager of Polaroid Corp.'s worldwide distribution division, which used the DMS-1000 Distribution Management System, he recognized that the DMS product differed from standard in-house management information system approaches in that it was designed to enable users to become involved with the process immediately. "We didn't design the food that the cats would like from a remote location," he said. "We were there when the cats were sampling as we went along," he said.

MCI Posts Record Profits, Revenues in Last Quarter

WASHINGTON, D.C. — MCI Communications Corp., the company that has captured more than one million long-distance telephone customers by undercutting AT&T, has reported record revenues and profits in its most recent quarter.

Profits rose 57% to $53 million or 48 cents per share, up from earnings of $34 million a year ago. Quarterly revenues meanwhile more than doubled to $331 million, compared with sales of $165 million the same quarter a year ago.

Revenues for the year ending March 31 topped the $1 billion level for the first time, reaching $1.07 billion, up from fiscal 1982 revenues of $506 million. Earnings in the year just completed were pegged at $171 million or $1.69 per share, a 98% increase over 1982's $87 million profits figure, the company reported.

Commenting on the company's rapid growth, William G. McGowan, MCI chairman, said the court-ordered divestiture of AT&T's local phone companies and other regulatory actions of the federal government have presented "major opportunities for further expansion of MCI's market share."

Injunction Issued Against Selling Apple Doubles

CUPERTINO, Calif. — Apple Computer, Inc. has been awarded a preliminary injunction issued against a Los Angeles microcomputer and peripherals distributor enjoining the latter from selling its Apple II look-alikes in the U.S.

Formula International had been selling the Pineapple computer, largely by mail order, prior to the May 2 injunction issued by U.S. District Court Judge Irving Hill. Hill specifically included Apple's Autostart read-only memory (ROM), Applesoft package, DOS 3.3 and Integer Basic in his injunction.

Hill concluded that Apple's U.S. copyright statutes cover programs stored in a computer's ROM components, whether in object or source code.

Hill said further that Congress intended to include operating system software under the protection granted by U.S. copyright laws.

A similar suit Apple filed against Franklin Computer Corp. is now pending before the Third Circuit Court of Appeals in Philadelphia. A lower court judge in that case ruled that the intent of Congress is unclear regarding the protection of software granted by copyright laws.

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Sen. Urges U.S. To Spend More on High-Tech R&D

(Continued from Page 139)

War II reindustrialization, directing scarce capital and government resources toward incubating those industries in which they could be most competitive.

The result, the senator continued, is that Japan today offers an educational system and industrial infrastructure that the U.S. should emulate, but is failing to do.

"We need a realization that we are in trouble ... We're lacking a sense of urgency," Tsongas explained. "We don't have an administration or Congress in this country that seems to be intent upon being competitive, but rather has an undue commitment and reliance on the laissez-faire system undirected in competing with Japan. I believe we should have faith in our system, but we should understand the need for change as well."

'We need a realization that we are in trouble ... We don't have an administration or Congress in this country that seems to be intent upon being competitive, but rather has an undue commitment and reliance on the laissez-faire system undirected in competing with Japan.' — Sen. Paul Tsongas

Tsongas offered a multipoint program to get America back on a competitive track, a program he is pushing with the influence and clout he wields as a member of several important Senate committees. He is a member of the Foreign Relations Committee, the Senate Export Caucus and a small business subcommittee.

First, he said, the U.S. as a government and industrial power should commit itself to spending 3% of its $3 trillon gross national product (GNP) fo research and development, about double that spent in 1982. Tsongas claimed that Japan has committed a similar percentage of GNP to research and development, as have the UK and France.

But, Tsongas said, the U.S. should find some middle ground between the totally state-directed French version of R&D spending and the free-market approach now followed in this country.

Second, Tsongas said he will join a host of other congressmen in pushing for passage of the High-Technology Morrill Act during the current session of Congress. The act calls for the federal government to spend up to $500 million annually in matching grants for higher education and private R&D. He rated the bill's chance of passage as "good."

And in a departure from the usual liberal Democratic line, Tsongas charged that current antitrust laws are outdated. Private industry, he said, must be permitted to "collude" to be competitive with the Japanese in the long term.

Labeling U.S. competition with the Japanese a "war," Tsongas said, "If they produce more engineers than we do, commit 3% of their GNP to R&D and we don't have a better education system and lower capital costs, there is an inevitability of their ascendancy and of our decline.

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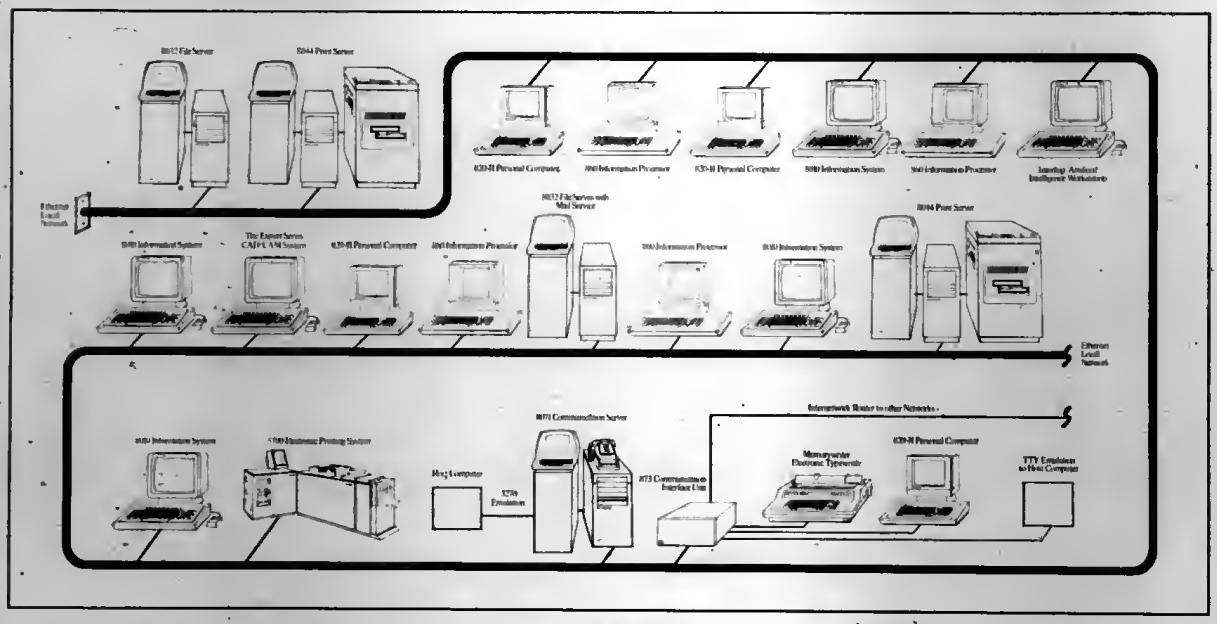

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On Expanded Bank Services

Federal Court Hears DP Services-Bank Debate

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The long-running battle between the DP services and banking industries over banks' plans to enter the DP business passed another milestone recently when a federal court here heard arguments on the government's decision to allow the expanded bank services.

The hearing before a three-judge panel of the federal appeals court was essentially a repeat of an earlier, protracted proceeding before the Federal Reserve Board, which last year decided to allow Citicorp and other large banking holding companies more freedom to offer DP services [CW, April 12, 1982]. Attorneys for the Association of Data Processing Service Organizations, Inc. (Adapso) told the court April 26 that the Fed had exceeded its statutory authority under applicable banking laws.

The issue was elevated to this court case when Adapso appealed the Fed's decision after failing to get that agency to modify its ruling acceptably. The association is asking the court to overturn the ruling, but at the recent hearing the panel made no immediate decision.

Adapso contends the new banking services are not closely related to traditional banking business under the definition as contained in laws regulating what services banks may offer, and that they would be unfair competition for existing DP services firms because of the size and strength of banking holding companies such as Citicorp. Also, the association suggests that banks, which are heavily regulated, could unfairly subsidize their DP operations with income from their main-line banking services.

Citicorp, which is at the center of the dispute because of its ambitious plans for a DP subsidiary to offer, among other things, banking at home and data base access services, maintains the new services are merely banks' efforts to exploit modern technology in the provision of traditional financial services. The new services are necessary, Citicorp attorneys further argue, if banks are to survive in the present, deregulated environment that finds such unlikely companies, including brokerage houses and retailers such as Sears Roebuck & Co., offering sophisticated financial services.

Adapso counsel Michael Nugent told the appeals court that the Fed exceeded its authority in deciding in Citicorp's favor last year. He also argued that the Fed erred, in part, because it based its decision on the fact that the data to be processed in the new banking services is financial and economic data. That "data test is a meaningless test," he told the court.

The fact that the data is economic does not make the services traditional to banking, he said. Nugent suggested such a test would allow services such as strategic planning and marketing, which are "general-purpose data processing services having no relation to banking."

He said although banks might in the past have offered such services to their customers on an informal and occasional basis, the Citicorp plans constitute a new "ongoing business venture" unrelated to previous customer services.

Judge Antonin Scalia, however, viewed Nugent's arguments skeptically, asking him in reference to this new type of service, "Is it new or is it just more efficient?" The judge suggested Adapso had not shown conclusively that Citicorp's plans are unacceptably unrelated to traditional banking services.

Similarly, Richard A. Whiting, an attorney representing Citicorp, countered that Nugent's argument "is little more than a play on words."

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Study Cites $262 Million CAD/CAM Trade Surplus

WELLESLEY, Mass. — The combined U.S. exports of factory automation systems, valued at $322 million in 1981 vs. $60 million worth of system imports, resulted in a $262 million trade surplus, according to a report released by Venture Development Corp.

U.S. manufacturers of computer-aided design and manufacturing (CAD/CAM) systems have been the most successful in satisfying the worldwide appetite for factory automation, according to the report entitled "The Factory of the Future: A Strategic Analysis."

The $291 million worth of exported CAD/CAM systems reportedly dwarfs export shipments of U.S.-produced robots and numerical controllers. Also, U.S. CAD/CAM imports appear negligible at present. This imbalance of exports and imports indicates the considerable technological strength of U.S. manufacturers in foreign CAD/CAM markets, according to the report.

In contrast, U.S. efforts to serve world markets for industrial robots have been far less successful. Only $19 million worth of robots were exported in 1981. Stacked against $11 million worth of imports, the net export was only $8 million.

There was a $37 million trade deficit posted by numerical controllers in 1981, the report said. While $12 million worth of numerical control systems was exported in 1981, $49 million in such systems was imported.

The Japanese share of the U.S. numerical controller market is expected to continue to increase for several more years, the report said. To do this, Japanese manufacturers will rely on increasing economies of scale as production volumes escalate.

The report costs $2,490 from Venture Development at 1 Washington St., Wellesley, Mass. 02181.

IBM Steals Second Place In CAD/CAM Revenues

(Continued from Page 139)

high-end software and networking capabilities, which provide users with an integrated system, according to John Spivak, industry manager of IBM's CAD/CAM support centers.

"A large part of our strength comes from the fact that we can offer an integrated CAD/CAM system," Spivak said, "integrated in the sense that one can do a preliminary three-dimensional design and then feed that design to an analysis program using the same system.

"Those analysis programs are big CPU burners, and you probably would not run them on a mini-type computer; you would be better off with an integrated system that allows you to do it all in one spot. By using one computer you don't have to carry tapes back and forth and worry about cross talk between two computers," he said.

Spivak said IBM's Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) networking capability is another reason for IBM's CAD/CAM success. While the IBM 4341 has been the most popular mainframe for CAD/CAM applications, Spivak said the SNA/SDLC links tie the 3250 to all mainframes from the 4321 to the 3083.

"There is a big gap today between the engineering guy that has designed the product and the guy that has to manufacture it. You really need the communications that will allow everybody involved in the design process to view the drawings. That way the guy in manufacturing can say, 'Hey, don't put that kind of bend in there — that's too hard to machine,'" Spivak explained. "The guy that takes care of inventory can say, 'Don't use that metal because we are out of stock.' This is also what I mean by the integrated approach."

Spivak documented the company's increased commitment to the CAD/CAM market by pointing to the formation last year of a "several-hundred-person" group within IBM that is dedicated solely to producing CAD/CAM products. Further proof of the company's desire to make an impact in both the CAD and CAM markets, he said, is the number of software packages the company has released over the last two years.

Some of those CAD packages intended for mechanical design applications include Catia, which complements the company's Cadam package; Fastdraft; Cades; and CBDS, which is intended for CAD applications involving electronics.

"IBM has pledged $40 million worth of CAD/CAM systems to 20 universities. That is a pretty good indication of how serious they are about this market," Stanley Klein, president of Technology and Business Communications, Inc. and editor of the "S. Klein Newsletter," said.

Klein attributed IBM's CAD/CAM success in the past two years to users frustrated by the limitations of their turnkey systems. "Initially, turnkey systems were the way people got into CAD/CAM," he said.

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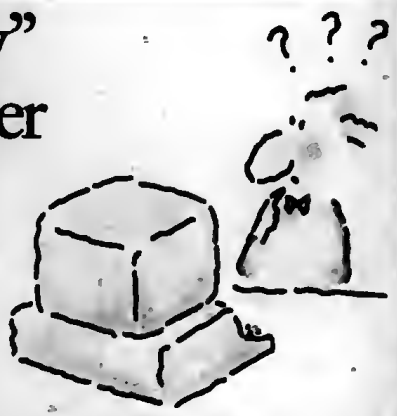

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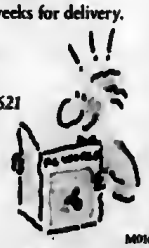

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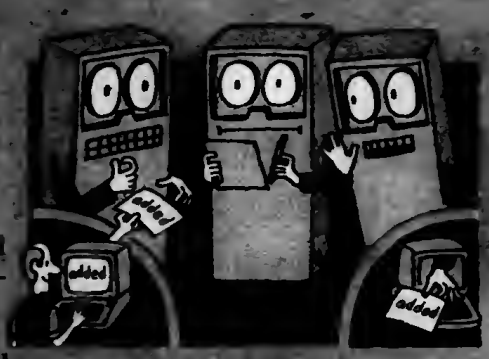

Consider this scenario: You have an inquiry response system that provides information on demand. This data is virtually error-free. You select among a variety of transmission speeds. Retransmissions, practically nil. Downtime, minimal.

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Communication Concepts from the Bell System

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Opens Sales Offices in Major U.S. Cities

West Coast Software House Broadens Horizons

By Jeffry Beeler
CW West Coast Bureau

WESTLAKE VILLAGE, Calif. — One of the U.S.' oldest software suppliers has finally begun to make the fundamental transition from a regional to a nationwide organization.

During the first 26 years of its existence, Computer Data Corp. never once ventured outside the greater Los Angeles area in its efforts to promote the company's line of application software packages.

Now, however, the firm is beginning to lift the self-imposed restrictions on its marketing activities and is expanding the scope of its business to cover the entire continental U.S.

Overseeing the expansion is William Goodale, Computer Data's recently hired vice-president of sales and marketing. Although he joined the company only about two months ago, Goodale has already established regional sales and support offices in five major U.S. cities — Chicago, Houston, Kansas City, New York and San Francisco.

A sixth such branch office is expected to open in Atlanta by the end of May, according to Goodale, whose business plan calls for the firm's revenues to balloon from $2.2 million in 1982 to $30 million in 1986.

Computer Data's decision to enlarge the marketplace for its products geographically was prompted at least partly by the company's desire to satisfy the huge untapped demand for software among wholesale distributors — customers the firm has hitherto ignored.

"For a long time, we've been getting requests for software from wholesale distributors throughout the country, and we've finally decided to respond to those requests," Goodale said.

But to take advantage of the distribution industry's pent-up demand for application programs, Computer Data first needs to establish a nationwide presence. "The potential customers for our distribution software are going to have branch offices all over the country, and they need to know that our company will have sales and support people in places other than just the Los Angeles area," Goodale said.

Success in pursuing the distribution software business will also depend, of course, on having the right selection of packages — a need the company is trying to address with the introduction of an additional product line. Aimed at wholesale distributors and scheduled for first delivery in May and June, the line will consist initially of three packages — one each for inventory control, sales orders and purchasing.

By the end of June, the distribution product family will gain a fourth software module, a package for personnel, Goodale said.

Founded in 1956 as a service bureau, Computer Data dabbled in application software almost from the beginning. By the time the company celebrated its 20th anniversary, software accounted for an estimated 25% to 40% of Computer Data's total sales.

Then, in 1978, the firm broke the software side of its business into a separate division, which at the time supplied only a line of application packages for the standard accounting functions like general ledger.

Since then, Computer Data has announced its intention to enter the distribution software business while continuing to develop its existing product line. The company has also remained in the service bureau business and has further diversified by becoming an OEM for the Hewlett-Packard Co. HP 3000-series processors and the Digital Equipment Corp. VAX systems line.

On May 18th, *Computerworld* launches its first communications satellite . . .

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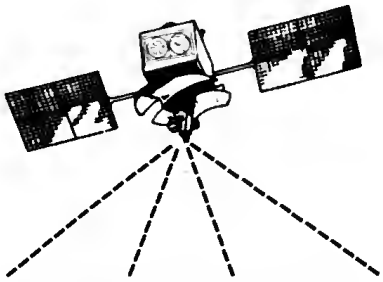
We are launching a new publication devoted to in-depth coverage of the broad spectrum of voice, image and data communications. *Computerworld On Communications* will examine communications issues, technology and applications from a systems perspective.

We recently did a study of *Computerworld* subscribers to determine their level of involvement and interest in communications. Of the 84% now using or planning to use communications equipment and services, 72% are personally involved in its selection and/or implementation. We found that these subscribers depend on *Computerworld* for communications information and prefer its coverage by more than 4 to 1 over the next publication in the field. This segment of our audience has a critical need for in-depth information on the constantly changing technology of communications.

As *Computerworld* expands its weekly news coverage of communications with interpretive information on products, equipment and services, *Computerworld On Communications* will complement that coverage with focused attention on the broader issues facing business communications users.

Computerworld On Communications will keep readers current on changing trends in the design, acquisition, operation, and optimization of corporate communications facilities. It will look at communications and networks from a systems perspective that relates technical capabilities with corporate goals.

In the two issues for 1983, *Computerworld On Communications* will apply the proven editorial resources of *Computerworld* to the area of communications networks. It will look at the implications of enhanced communications within the business organization together with the impact on established systems operations.



So, if you're among the majority of *Computerworld* subscribers who are personally involved in the selection and implementation of communications equipment and services for their organization, you'll find *Computerworld On Communications* a valuable addition to the *Computerworld* family of special publications.

As a *Computerworld* subscriber, you will automatically receive the two 1983 issues of *Computerworld On Communications* as part of your subscription. If you're not already subscribing to *Computerworld*, call *toll free* 800-343-5730.

Remember to look for *Computerworld On Communications* on May 18th and again on September 28th

For advertising information on *Computerworld On Communications*, call Bill Dwyer, National Accounts Manager at (617) 879-0700 or your local *Computerworld* sales representative.

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IBM's Papes Named to Post In ISG Group

ARMONK, N.Y. — IBM today announced that IBM Vice-President Theodore C. Papes Jr. has been named assistant group executive, plans and programs, of the Information Systems Group (ISG).

Papes' responsibilities will include the finance and planning, management systems and business practices functions. ISG markets and maintains all IBM products in the U.S. and its territories and provides specialized systems to the federal government. ISG is headquartered in Rye Brook, N.Y.

Succeeding Papes as head of corporate management systems and organization staff at the company's headquarters in Armonk will be IBM Vice-President Thomas M. Liptak. He will be responsible for organization planning and planning systems.

Ronald F. Casella, IBM vice-president, has succeeded Liptak as president of the Customer Service Division. The division, a part of ISG, provides maintenance, support and programming services within the U.S. for small information processing systems, related peripherals and office and communications products.

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Harris Restructures Government Systems Sector

MELBOURNE, Fla. — Harris Corp. has announced the restructuring of its Government Systems Sector in a move that creates a new group, six divisions and two operations. It previously consisted of four divisions.

Harris said the changes were made to accommodate anticipated growth while reflecting a "philosophy of highly decentralized operations." The sector's 1982 sales were pegged at $400 million, up 30% from the previous year, with similar increases expected by the firm in '83.

Phil Cobb, former vice-president and general manager of one of the sector divisions, will serve as vice-president and group executive of the new sector. Reporting to him will be Richard Farotto, vice-president of the Satellite Communications Division; Allan Beaupre, vice-president of the Data Communications Division; and Lawrence Cassel, vice-president of the Satellite Terminals Division.

Charles Herbert will head the Aerospace Systems Division, Phillip Henderson the Information Systems Division, Arthur Vernon the Electronic Systems Division, Julian Scott the Special Programs operation and Phillip Farmer the Support Systems Division. Richard Hartig has been promoted to vice-president of business development of Support Systems.

Productivity Improvement Cited

Robots' Flexibility Seen Key Factor

WELLESLEY, Mass. — While productivity improvement is the prime impetus behind the increasing use of industrial robots, there are a number of individual factors that generate the desired improvements in productivity. According to a new user survey conducted by Venture Development Corp., the flexibility resulting from the use of industrial robots is their most attractive attribute.

"The Industrial Robot Industry: A Strategic Analysis" claims the combined U.S. production and import of industrial robots will expand from the $192 million level in 1982 to $828 million in 1987. The average growth rate over that period will be 34% per year.

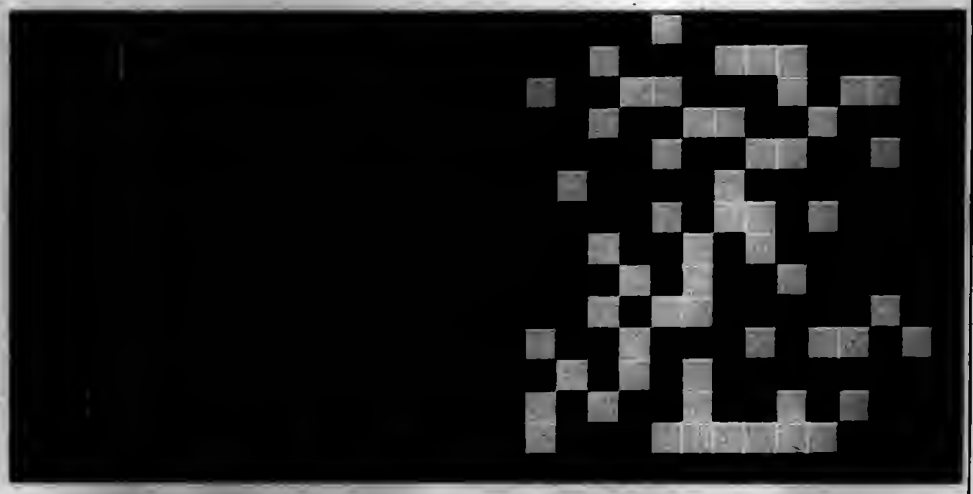
As users see it, the manufacturing flexibility offered by robots will reduce the economies of scale required for the automation of a manufacturing process. Instead of being dedicated to the manufacture of a single high-volume product, flexible manufacturing systems provide the capability to manufacture many different product families on the same machinery.

Furthermore, the study notes, flexible robot systems enable a rapid switch from one product to another without major penalties for setup and changeover costs.

Reduction in the economies of scale will attract more competitors and will also increase the ability of manufacturing industries to respond quickly to changes in market needs. At the same time, the competitive environment will become more intense.

More intelligent robots employing sophisticated large-scale integration/very large-scale integration, software and sensor technologies will correspondingly increase their flexibility. This enhanced flexibility will further differentiate robots from conventional "hard automation."

According to users, the second most attractive benefit afforded by robots is the reduction in dependence on labor, not only in tedious or hazardous jobs, but also in those requiring skilled operators. Increases in plant capacity, as well as quality improvements, were reported to be the third and fourth most important attributes of industrial robots, according to surveyed users.



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deCastro Tells Symposium Attendees

Shakeout Seen for One-Product Micro Vendors

By Bill Laberis
CW Staff

FRAMINGHAM, Mass. — The future of business microcomputing belongs to vendors offering upward migration to larger systems, not to the plethora of single-product companies that may well find themselves "shaken out" of the market in a few years.

So said Edson deCastro, president and founder of Data General Corp., at a recent symposium here titled "The Small Systems Economy: Crisis and Opportunity," sponsored by the Interface Group.

However, the "old guard" in the computer industry — those companies a decade old or more — have to develop more of an end-user orientation and offer better applications software or run the risk of being shut out of the burgeoning microcomputer market. This observation was made by Peter Lowber, senior market analyst with the Boston-based Yankee Group, who also spoke at the symposium.

DG's deCastro said his company is poised for success in the micro arena because of its ability to offer users both a present and future personal computer solution. DP departments, he said, are taking a closer look at computing expenditures, directing micro purchases to those products that can be most easily upgraded to accommodate growth. DG is slated to announce its first entrant in the personal computer arena "sometime soon," deCastro said.

"It is not always the first in the market that is the most successful," deCastro said, commenting on the "traditional" computer companies like DG that have either recently announced personal computer offerings or have yet to do so. "There is still room enough for new vendors to enter the market, and those who enter may take advantage of the lessons learned over the past five years. We are in a first-time buyers' market now, but in a few years we will be part of a replacement market, which may be difficult for single-product vendors," he said.

For companies such as DG that grew up in the minicomputer and mainframe era, the micro surge of the '80s presents some unique challenges, deCastro continued. "For many computer vendors who remember the days when they built a hotbox and pushed it out the door to OEMs, this is a far different market," he remarked.

One of the more formidable of these challenges is the means of distribution of micro products, he said. Asked if DG would market its yet-to-be-announced personal computer through retail outlets, deCastro hedged, saying the retail "channel is pretty full right now."

Lowber said that while the traditional minicomputer and mainframe vendors bring tremendous financial clout and technical expertise to the micro market, they also bring inherent handicaps that they must overcome to be viable micro vendors.

CW Photo by B. Laberis
Edson deCastro

For one thing, Lowber said the mini makers that have announced personal computers have been slow to seek applications software development from third-party software houses. It was IBM's decision to utilize the third-party vendors that enabled the company to score a "market miracle ... overwhelming the market" with an overrated piece of hardware, Lowber said.

But most important, according to Lowber, is that the mini makers are not end-user-oriented to the extent they need to be to capture the masses of first-time users seeking personal computers.

Study Sees Communications Impacting Future Micro Sales

LOS GATOS, Calif. — Data communications will become one of the leading factors affecting microcomputer sales growth and use in this decade.

That is one of the findings of a study just released here by Enlon Associates that focuses on the microcomputer arena.

"Microcomputer Data Communications, 1983" describes the U.S. potential for data communications in light of microcomputer growth, forecasting sales of 28 million microcomputer systems valued at $20 billion by 1990. The study also forecasts a total installed base of 100 million units by that time.

The study predicts rapidly increasing workstation acquisition, with sales rising to more than four million units by 1990, at which time 625,000 local-area networks with over five million nodes will be in place. In addition, revenues of local-area network vendors will increase 96% per year to an annual total of $2 billion by 1990, the report noted.

The report also details the technology and market trends for remote data communications, discussing two-way communications, bulletin boards, information utilities, data bases, electronic mail and banking and shopping — all of which the study predicts extensive use of by 1990.

The study is priced at $1,600 from Enlon Associates, headquartered at 119 Belvue Drive, Los Gatos, Calif. 95030.

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Engineers Need CAE Tools to Excel, Exec Says

By Robert Batt
CW West Coast Bureau

SAN DIEGO — Engineers in the computer and electronics field will not be able to function effectively without direct and individual access to computers dedicated to their specific needs.

This was the main theme of a speech by Alan Dawes, director of marketing, engineering information systems, at Versatec, Inc., a subsidiary of Xerox Corp., at the Fifth Annual Conference on Computer Graphics '83, sponsored by Frost & Sullivan, Inc. here recently.

Dawes outlined two industry trends confronting engineers and forcing them toward the use of computer-aided engineering (CAE) tools:

CW at Computer Graphics '83

- A drastic shrinkage of time between original project concept and full implementation, covering phases such as project funding and design implementation, production engineering and manufacturing, marketing and distribution.
- A simultaneous, severe new set of pressures revolving around the cost and complexity of new products, including increased marketplace competition and the urgent need for higher productivity on the part of everyone in the product development process, at every level in the organization.

Computer engineers, Dawes asserted, must get more and better results for every hour of their work. They must integrate quality and reliability into the entire development process, while remaining technically competitive. The use of intelligent workstations will reduce design and rework time, get the product to market more quickly and result in better and more powerful end products.

But so-called user-friendly tools are not sufficient, he warned. "We must make our technological solutions user-transparent. In other words, we want to do our work, not have to think about our tools. They must become natural, second nature, intrinsic to our minds and eyes, our hands and our working goals."

The provision of individual workstations is also not enough, Dawes added. Because of the teamwork nature of most engineering jobs, engineers require a network of similar workstations with which they can interact. There is a need to establish local, regional, national and even international networks without degrading individual workstations' performance.

The goals of such a system, he said, are to create, process, edit, file, print and distribute engineering information electronically, at much lower cost and in much less time than has been available. Actual workstation cost and system cost, he asserted, will depend on user configuration, how many peripheral services support how many workstations, how large the files and networks are, how many engineers are being served and how extensive the system turns out to be.

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Japan's Graphics Seen on the Rise

(Continued from Page 139)

Machover said, "To date, the computer graphics hardware and systems market has been dominated by U.S. manufacturers, and the Japanese have not been major contenders.

"Over the next few years, however, I expect to see much more aggressive hardware product entries from the Japanese," he said.

Machover noted that one Japanese manufacturer, Seiko Ltd., has announced a high-resolution monitor and digitizer, while Hitachi Ltd. is also showing signs of becoming an aggressive supplier of graphics systems.

Turning to the question of software in the graphics industry, Machover predicted the emergence of much more specialized software oriented toward specific applications. "We are beginning to see more and more product introductions that make it relatively easy for the non-graphics- or computer-skilled user to use these systems as problem solvers," he asserted.

In the CAD/CAM area, he claimed, the major thrust is in solid modeling with systems that use combinational geometry capable of displaying extremely complex images. "The expectation is that these systems will be continually improved to allow for interactive modeling and that traditional line drawings will simply be a by-product of the solid modeling procedures."

So far, the presentation of realistic images has either suggested extremely long computation times or extremely expensive hardware. Over the next decade, he said, the cost of hardware for real-time representation of realistic images should be reduced.

By the middle of the decade, he predicted, it should be possible to buy such systems for between $100,000 and $200,000, according to Machover.

Audience Warned Of 'Graphics Anarchy'

CW at Computer Graphics '83

By Robert Batt
CW West Coast Bureau

SAN DIEGO — A strong warning about the growth of "graphics anarchy" was issued to participants attending the Fifth Annual Conference on Computer Graphics '83 held here recently.

In a speech titled "The Application of Computer Graphics to the Decision Support Process at Senior Management Levels," Robert Widener, presiden' of Intelligent Interlink Corp., cla' i the graphics industry is lackir.g in basic business disciplines.

"The graphics market has been seen by many people as a new toy and has been driven by technology rather than by business methodologies or disciplines. This will lead to graphics anarchy unless some standards are put in place," he asserted.

Widener emphasized the emergence of graphics standards as the key to the credibility of graphics as a business tool and its acceptance by senior management. "We have defined algorithms that cater to management decision making and yet we haven't come up with applications that reflect management's point of view," he stated.

Most graphics charts, he pointed out, do not have a common frame of reference that leads to their being distrusted as a management tool by top executives, particularly in the current dynamic economic environment. "If we don't have a set of disciplines and ground rules by which our charts are made, we are going to invite chaos," he added.

Also speaking at the conference, which was sponsored by Frost & Sullivan, Inc., was Peter Preuss, president of Integrated Software Systems Corp. Preuss stressed the need for more user-friendly systems.

"In the graphics industry, we have set our expectations of the user too high. Training is no longer an acceptable concept in business graphics. The need is to make devices easier to use," he told his audience.

The ability to make systems more flexible is vital to the growth of the industry, he said. Very often the user's attitude is, "If i can't get it the way i want it, i don't want it at all."

He also warned of the need to increase quality which, he stressed, is now being demanded by large corporate users and cannot be regarded as a luxury.

Nevertheless, Preuss claimed, the graphics industry will continue to experience rapid growth, which is due, in large part, to the rapid increase in computers per user site. "The functional growth of business graphics as a management tool is increasing exponentially with the growth in organizations," he said.

He pointed to the fact that 67 new graphics devices were introduced into the market last year and noted that some large corporations, such as 3M Corp. and Schlumberger Ltd., are now substantial users of graphics.

Preuss claimed the connection between data and graphics will allow for a much expanded use of computer graphics, particularly in the area of manufacturing. "To access data, the user cannot be restricted to the data base because a lot of data will not be stored there. In gaining access to data, software will be an integral part of the graphics market, and a graphical report generator will be a tool that users will require on a continuing basis," he added.

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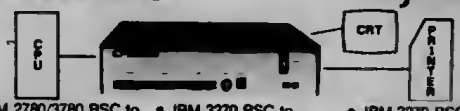

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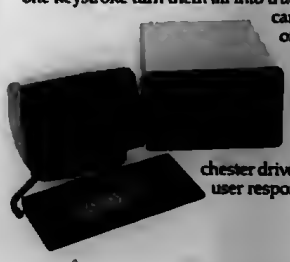

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BRÆGEN

Higher Performance Graphics Systems Seen

By Robert Batt
CW West Coast Bureau

CW at Computer Graphics '83

SAN DIEGO — Technological developments will lead to the introduction of much higher performance graphics systems within five years with raster displays in particular having a competitive advantage.

This prediction was made by John McPherson, president of Vector General, Inc., a graphics manufacturer, in a speech at the Fifth Annual Conference on Computer Graphics '83, sponsored by Frost & Sullivan, Inc.

McPherson said the use of very large-scale integrated (VLSI) circuits, the constantly falling cost of memory and higher volumes in terminals means that performance is increasing at a time of corresponding price reductions.

"As a result, we will have a high-performance graphics system by 1985. Raster displays with a resolution of 2,000 by 2,000 pixels will be produced economically, and a display that has a resolution of [2,000 by 2,000 pixels] will meet just about all the resolution requirements of almost any user," he claimed.

Because of these developments, raster displays will experience substantial cost reductions, but the cost decline of vector displays will have run its course, he asserted. "The raster will benefit from the continued decline of semiconductor prices as new, more dense VLSI and memory devices are developed. As a result, by 1967, I think we will see high-performance, full-color raster display systems selling at about $10,000 per workstation," he added.

McPherson said that with a growth rate of 30% a year, the market for graphics display will reach $10.6 billion by 1987, compared with $3.7 billion today. This market will include display systems, controllers, processors including mainframes and the software necessary for the system to serve its intended use.

"Very few systems will ever truly be stand-alone. Most applications require a hierarchy of processing, allocating tasks on the basis of need and economics. Communications is a very important part of the display system today and will increase over the coming years," he asserted.

With today's state of the art, McPherson said, there are significant differences that dictate the choice of display system. Different applications, he suggested, will dictate the use of different display systems. If high resolution is required, users will choose vector displays, he maintained, because of the greater number of elements available and because of their ability to communicate quickly via the CRT face using light pens or data tablets.

When it comes to simulation techniques, however, raster technology is more applicable because the function requires area fill (the ability to display a shading within the outline of an object), which can only be performed by raster, he claimed.

McPherson predicted that raster will command around two-thirds of the overall computer graphics market by 1987 because of technological developments, with raster color display systems costing between $10,000 and $25,000, compared with $60,000 in 1981.

New Companies

Forte Data Systems, Inc. will manufacture interface products that permit direct communications between personal computers and mainframes via coaxial cable connections. It is located at 1500 Norman Ave., Santa Clara, Calif. 95050.

C. Itoh Electronics, Inc. and its marketing firm, Acro Corp., have formed a new subsidiary, **CIE Terminals, Inc.** The new company, located in Irvine, Calif., will market C. Itoh Electronics' terminal product line and 300/600 line/min dot matrix line printers.

Intelligent Technologies International, a new company specializing in integrated microcomputer hardware and software, has named Verlaine Crawford vice-president of marketing and Edward Brennan vice-president of operations and finance. The firm is located at Suite 302, 151 University Ave., Palo Alto, Calif. 94301.

Advantage Systems, Inc., 395 Totten Pond Road, Waltham, Mass., is a new company offering integrated hardware and software systems for banks on a turnkey basis.

Dr. Robert B. McCullough, a founder and past vice-president of operations of Magnusoh Computer Systems, Inc., has started **Sunol Systems**, a firm that will design and manufacture peripheral products. The company can be reached through P.O. Box 1777, 1072 Serpentine Lane, Pleasanton, Calif. 94566.

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We were there at the birth of modern word processing. So it should come as no surprise that when we designed the Raytheon information processor, we didn't forget that human beings come with backs, arms, fingers, necks, eyes and other assorted parts. And use them in different ways to do different jobs.

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Mixed Reports Filed on Comdex Show Layout

By Katy Gurley
Special to CW‡

ATLANTA — The first Comdex show to have exhibits in two separate halls is being hailed as a success by its promoters, but has been widely criticized by exhibitors who said one of the halls was poorly attended.

A petition requesting a partial refund from The Interface Group, Inc., the show's promoters, was circulated among exhibitors at the Atlanta Apparel Mart during the last three days of the show, Comdex Spring '83.

The petition asked for an unspecified reduction in Comdex Spring '83 booth rates with the difference to be applied to future booth space. It also requested that special consideration be given to Apparel Mart exhibitors in choosing future booth space. The petition of about 15 names was presented to Interface President Sheldon Adelson the day before the show closed. There were between 160 and 170 exhibitors in the Apparel Mart, an Interface official said.

Of a dozen exhibitors interviewed at random by *ISO World* at the Apparel Mart on the third day of the show, 10 said they were disappointed by low attendance. A few said they had signed the petition; others said they had not seen it. About 550 exhibits were held in the nearby World Congress Center, where all other convention activities were held and attendance was reportedly higher.

Complaints by Apparel Mart exhibitors included limited parking near the Mart, slow bus shuttle service and the lack of seminars or other crowd-drawing activities, according to Len Wilker, president of Teletex Communication Corp. of Foster City, Calif., and a spokesman for the loosely formed group of Apparel Mart protesters. All seminars and the conference keynote speech were in the World Congress Center.

Richard Katzeff, vice-president of operations for Interface, said no official response has been made to the petition-signers, but that it was doubtful that any refunds would be offered.

"I doubt very much if we would do a thing like that. It would establish a terrible precedent," he said. "From everything we heard, overall, people were very well satisfied." Traffic at the Apparel Mart was slow on April 25, the show's first day, but during the rest of the week the aisles "were so crowded you couldn't walk through," he said.

Exhibitors are assigned space at

(Continued on Page 158)

Dealer Success In Micro Mart Hinges on User

By Susan Carlson
Special to CW‡

ATLANTA — The focus in the personal computer industry today is shifting "away from the system and toward the individual," Philip D. Estridge, IBM vice-president, told dealers here at the recent Comdex Spring '83.

Estridge advised dealers that their own success will depend on whether they "go the extra mile to support the customer.

"In many ways, the strength of our industry appears to be its technology, the quality of products, their reliability. All of those things seem very dazzling right now," Estridge said.

"But the key to success in the personal computer industry is not technology. It's our persistent focus on servicing the customer. Technology will fade and change. The thing that endures is service."

Estridge's remarks were part of the keynote address he delivered opening the Comdex show on April 24. Hundreds of dealers and exhibitors gathered in the auditorium of the Georgia World Congress Center to hear Estridge before attending the four-day show.

"The personal computer industry," Estridge said, "is going through an important shift, a shift that many industries are unable to complete. It's a hard shift to make, and it comes at a time when it doesn't seem necessary — when sales are peaking." But from amid the expanding multitude of new products and new computer dealers, the critical element, he said, will be service. "That is a requirement. All else will fail if that fails."

Throughout his remarks, Estridge noted that changes in the Industry have created "stress in the distribution channel." Those changes include not only the demand for customer service, but also the dizzying proliferation of products and the lack of user sophistication.

Estridge also acknowledged the stress exerted on dealers from product shortages and from competition from IBM's direct sales force. In recent weeks, dealers have expressed mounting concern over those issues.

"I wish we had a large enough supply to fill all orders," he said. "And I wish there was no competition with our direct sales force, but there is."

Estridge advised his audience to focus less on the competition and more on the customer.

"Keep an eye on the customer, not the competition," he said. "The competition won't buy your products — at least they haven't bought ours."

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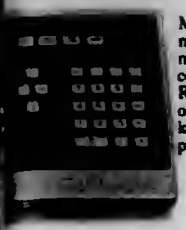

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Printer Manufacturers Moving Into Retail Mart

By Katy Gurley
Special to CW‡

ATLANTA — Printer manufacturers who have traditionally sold through OEM channels are polishing up their products, putting their own labels on them and moving them through the retail market.

Two such firms — Alphacom, Inc. and Anadex, Inc. — have recently established new marketing strategies to sell products through traditional retail channels, according to spokesmen for the firms.

This is being done in addition to their OEM programs.

The reason for the move, they said, is the explosive growth of the microcomputer industry in general. The demand for printers parallels the growth of personal computers, enabling a manufacturer nowadays to make more money by selling printers both to the retail and OEM markets, the spokesmen said.

Escalating Trend

Veteran peripherals distributor Jay Freeman of F.A. Components in Carona, N.Y., said this trend has been growing over the last two years.

"You can see it in the way contracts are given to distributors. It used to be that the contracts were pretty much based on high quantities with no two-tier setup," he said, noting that those contracts have been changing.

"Many manufacturers are starting to wake up to the fact that there's a market out there they've been missing," he said.

Several modem, disk drive and printer manufacturers have recently begun offering two-tiered programs to distributors, he said.

Anadex, which has built its OEM reputation on its high-volume workhorse serial dot matrix impact printers, entered the retail market with its full product line in December, said Richard L. Weaver, marketing communications administrator.

'Over the past couple of years, we began to notice that the retail market has really opened up," he said.

The Chatsworth, Calif.-based firm was cautious at first and decided to make a push for the retail market only after some serious in-house soul searching last fall, he said.

The firm is now confident that the retail market is a big money maker and has established a full dealer support and incentives program, he said.

According to Weaver, the OEM avenue, however, is still the firm's

(Continued on Page 160)

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GOULD Electronics

Mixed Reports Filed on Layout Of Comdex '83

(Continued from Page 157)

Comdex on the basis of early sign-up, the number of years they've exhibited and prompt payment records, Katzeff said. Space in the Apparel Mart was assigned after the World Congress Center was full, he said.

Katzeff said Interface is open to suggestions on improving Comdex and will make changes that "sound reasonable" for future shows.

"We don't feel we failed. We feel that we significantly succeeded. We think people were happy, and they said that by signing up for next year," he said, noting that about 625 exhibitors have signed up for the spring 1984 show.

About 32,000 people attended the show, making it the largest in Comdex history, according to incomplete tabulationa by Interface. Katzeff said complete figures would show that attendance was much higher.

Exhibits for the next show, Comdex Fall '83, to be held in Las Vegas in November, will be divided among four halls and possibly some mobile units set up on a parking lot next to the main convention center.

Next year's spring show, to be held here again, will be spread out into the Atlanta Merchandise Mart, in addition to the Apparel Mart and World Congress Center, he said. The Merchandise Mart is adjacent to the Apparel Mart, with the World Congress Center about a 10-minute walk away.

Wilker, of the protester'a group, said show promoters need to be better prepared for the expansions.

"We feel that The Interface Group didn't promote the Apparel Mart appropriately," he said. "The crowds were just not coming, and that means losing a lot of business."

Several exhibitors agreed.

"I think the biggest problem was that there's nothing to draw people over here but the exhibits," said Bob Love, marketing support manager for Rexon Business Machines of Culver City, Calif.

Al Rocheleau of Trilog, Inc., of Irvine, Calif., said it was too soon to tell if the trip to Comdex was worthwhile. "But my gut feeling," he said, "is that if we don't get into the main hall next time, we won't be here."

Others said the Apparel Mart crowd size was just right. "We've had enough traffic here to keep us busy," said one exhibitor. "Any more and we'd have been swamped."

Cliff Emerick of Duosoft Corp., Savoy, Ill., said the smaller crowds in the Apparel Mart gave him more time with customers. "We really prefer it this way," he said.

Supershorts

Dataquest, Inc.'s Display Terminal Industry Service is sponsoring its first conference, "Display Terminals: Growth Opportunities and Challenges 1983-87," June 22-24 at the Del Monte Hyatt Hotel in Monterey, Calif. Speakers will include Edward J. Kfoury, IBM; Arthur T. Campbell, Digital Equipment Corp.; Robert Degan, Falco Data Products, Inc.; and Karen Nussbaum, executive director of 9 to 5, National Association of Working Women.

• • •

Honeywell, Inc. will open a public videotex demonstration and support center in Chicago in mid-1983. Reported to be the first of its kind in the country, the center will feature two Honeywell DPS 6 small computers running Teletel videotex packages provided by **Videographic Systems of America.** The center will also develop new videotex simulations and models and serve as a benchmark test site and training resource for prospective customers.

• • •

Digital Equipment Corp. has named **Entre Computer Centers, Inc.** as a nationally authorized distributor of its Professional and Rainbow computers. Entre, a franchiser of retail computer centers, has approximately 70 centers open or under development in 20 states.

• • •

RCA Astro-Electronics of Princeton, N.J., has been awarded a contract by **American Satellite Co.** for the construction and launch support of two commercial communications satellites. The contract has a potential value of over $100 million.

• • •

Dynamicro Software Corp. has signed a licensing agreement with **Via Computer, Inc.** that will permit a version of Via's Prophit II financial modeling software to be marketed as an integrated module of The Business Library accounting/management information system. The microcomputer software products of Dynamicro Software are marketed through retailers under exclusive license by **Software Libraries, Inc.,** a co-licensee in the agreement, using the name The Business Library.

• • •

Control Data Corp. has signed a letter of intent to invest in the Reader's Digest Association, Inc.'s videotex subsidiary, **Source Telecomputing Corp.**

• • •

Honeywell, Inc. has signed an agreement with **Masstor Systems Corp.** for the development and marketing of Masstor's Massnet and shared virtual-storage system on Honeywell's Gcos 8-based, large-scale computer systems.

• • •

John S. Cullinane, chairman of the board and chief executive officer of **Cullinet Software, Inc.,** has been selected to chair Northeastern University's College of Computer Science Industrial Advisory Committee.

• • •

AST Research, Inc., developer of hardware and software for business firms using the IBM Personal Computer, has formed a Systems Marketing Group. Dr. Jerry Orosz has been appointed director of the unit.

General Instrument Corp.'s Data Systems Service Division will provide customer maintenance services for **Sytek, Inc.'s** broadband local-area network under a recently signed agreement.

• • •

United Technologies Corp. has awarded MIT a three-year, $750,000 grant for the school's microelectronics research program.

• • •

Software Research Co. has released "Micro Software Distributors: A Sourcebook for Publishers Seeking New Markets." The directory contains profiles of over 150 companies seeking programs for resale and is available through Drawer 1, P.O. Box 9524, Washington, D.C. 20016.

Management Assistance, Inc. (MAI) has signed a letter of intent with **General Automation, Inc.** for MAI/Sorbus to provide computer service and maintenance to all of General Automation's U.S. customers.

• • •

Decision Resources, Inc. has signed a distribution agreement with **Nippon Information Sciences, Ltd.** to provide personal computer software graphics programs that have been adapted for the Japanese market.

• • •

Gould, Inc.'s SEL Computer Systems Division has donated a Concept 32/8750 computer system, valued at $477,000, to the Research Triangle Institute. Discounts of up to 30% on Gould products are available to other qualified universities.

• • •

Data General Corp. has announced an agreement with **Software International Corp.** to promote and market Software International's general ledger and financial reporting system for use on its Eclipse MV/Family systems.

• • •

NCR Corp. is donating several computer-based systems for food service management to the Michigan State University School of Hotel, Motel and Institutional Management. The systems are scheduled to be installed before the beginning of the fall term.

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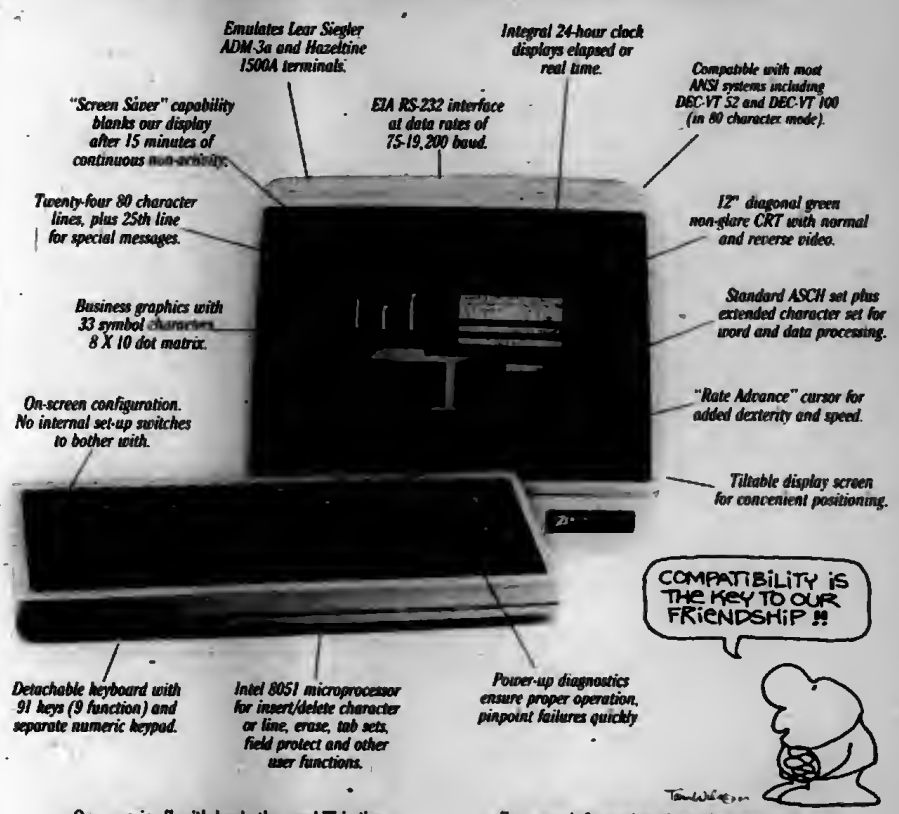

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Nickels & Dimes

Cincom Systems, Inc. has reported revenues of $54.4 million for fiscal year 1982, an increase of 30% over 1981. Net profits increased by 220%, while earnings per share more than tripled.

$ $ $

Compaq Computer Corp. has raised more than $20 million in its third round of private equity financing. The firm has also secured a $10 million revolving line of credit from Interfirst Bank Houston.

$ $ $

Gould, Inc. has reported that first-quarter net earnings for the period ended March 31 declined 27% to $14.1 million, or 32 cents per share, from $19.4 million, or 44 cents per share, for the same period in 1982.

Computer Consoles, Inc. has reported a 28% decline in revenues and a net loss of $2.1 million, or 39 cents per share, for the three months ended March 31, compared with last year.

$ $ $

Rolm Corp.'s has reported earnings for the third quarter ended April 1 of $146 million and sales of $125 million, up 42% and 25%, respectively, over last year.

$ $ $

For the six months ended Jan. 2, **Centronics Data Computer Corp.** has announced net sales of $82.4 million with an after tax loss of approximately $18.6 million.

$ $ $

Cray Research, Inc. has reported revenues of $27.5 million and net earnings of $2.16 million, or 15 cents per share, for the first quarter ended March 31, compared with $23.3 million, or 12 cents per share, for the comparable period last year.

$ $ $

Mentor Graphics Corp. has raised $7.2 million in its third round of venture capital funding from 15 firms led by original investors Venrock Associates, Sutter Hill Ventures and Greylock Management.

$ $ $

Harris Corp.'s income for the third quarter, ended April 1, declined 6% from the same period last year while sales increased 7%.

$ $ $

NBI, Inc. has reported a net loss of $3.5 million, or 34 cents per share, on revenues of $23 million for the third fiscal quarter ended March 31, compared with net income of $2.6 million, or 29 cents per share, on revenues of $25.1 million for third quarter 1982.

$ $ $

Northern Telecom, Ltd. has reported unaudited consolidated revenues for the first quarter 1983 were $774 million, up 7.9% from 1982 first quarter. Net earnings, before an extraordinary gain, were up 42% for the same period.

$ $ $

The Reynolds & Reynolds Co. has reported a 50% increase in net profits during the second quarter of fiscal year 1983 and sales of $66.2 million, up 7%, for the quarter.

$ $ $

Paradyne Corp. has reported revenues for first quarter, ended March 31, were $54.6 million, up 21% from the same period a year ago. Net income after taxes was $5.5 million, a decline of 3%. Legal expenses in the first quarter in connection with a Securities and Exchange Commission investigation and suit against the company were approximately $300,000.

$ $ $

Timeplex, Inc. has reported third-quarter revenues of $11.2 million, 39% ahead of revenues for the third quarter last year. Net income was $1 million, compared with $390,000 for last year.

$ $ $

Computer Sciences Corp. has reported that earnings were flat during the year, with net earnings of $17.9 million, or $1.32 per share, for 1982.

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Printer Makers Enter Retail Mart

(Continued from Page 158)

major focus.

Alphacom, of Campbell, Calif., began a retail marketing program in January for its newest product, the Alphacom 42. A second 80-col. printer, to be introduced in June, will also be available to dealers for retail sale by fall.

"This new retail arm has the opportunity to explode because of the uncertainty of the marketplace right now," said Bill Sobieski, vice-president for consumer marketing and sales.

The firm will maintain its OEM marketing branch for its other lines of thermal printers, print mechanisms and controllers because that channel is consistently profitable, he said.

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Div of TaskForce Inc PO Box 6888
Greensboro North Carolina 27405
(919) 373-1461

PHILADELPHIA: Systems Personnel Inc
115 West State Street
Media Pennsylvania 19063 (215) 565-8880

PHOENIX: Professional Career Consultants
4628 North 17th Street Suite H101
Phoenix Arizona 85016 (602) 274-6666

SAN FRANCISCO: The Computer Resources Group
Inc. Agency, 303 Sacramento Street
San Francisco California 94111 (415) 398-3535

SEATTLE: Hauser Martin Morris & Associates
1940 116th Avenue N.E.
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National Computer Associates

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Electronic Funds Transfer Systems are shaping the financial services industry. Midwest Payment Systems is committed to the development of large scale IBM online systems directed towards servicing the financial and retail community. At MPS we are proud of our history of innovative network design. Today we represent one of the 10 largest ATM networks in the U.S. with 1500 SNA terminals linking 64 banks, savings & loans and credit unions in 8 states. Fewer than 20 banks in America can offer such total data switching capability. With our sophisticated Switch and emergence into Point of Sale processing, expansion is limitless.

As a result we are soliciting Senior Systems Analysts experienced in the total design of IBM online application systems. Qualifications include 3-5 years OS Assembler language in a SNA/SDLC environment. In addition to providing software support for the data communications network, duties include development in an organization offering the highest technical challenge. Your management capabilities will also be realized through project responsibilities and personnel administration. MPS offers an excellent salary, company paid profit sharing and full relocation.

Qualified candidates interested in learning more about MPS opportunities should forward resume to Gregg Fitzgerald, Midwest Payment Systems Division, The Fifth Third Bank, Dept. 00828, Fifth Third Center, Cincinnati, OH 45263. (513) 579-5289.

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The BHHS Data Center supports the growing DP needs of BHHS member hospitals and health care facilities in Arizona.

We offer excellent salary and competitive benefits. Please submit resume and salary history in confidence to:

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Samitri Hospitals &
Health Systems
2504 W. Northern Ave.
Suite D-300
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MANAGER—DECISION SUPPORT SYSTEMS

Abbott Laboratories is a leading international manufacturer of health care products. We are presently seeking an experienced, entrepreneurially-oriented professional to establish and manage the decision support services function for one of our major operating divisions.

Leading a team of systems consultants, the individual selected will be responsible for the development of decision support systems to maximize the effectiveness of our customer relationships. This responsibility involves assessing the information needs of both the company and our customers, supervising the selection and development of the hardware and software required to meet those needs while lending expertise and support of our marketing effort.

Qualified applicants should possess a minimum of 10-15 years significant experience in all phases of information management, coupled with exceptional communication skills and conceptual abilities. This background should include a knowledge of mini and microcomputer systems and their application to business issues such as sales forecasting, logistics, production planning and customer service. Previous experience in the management of consulting and vendor relationships is highly desirable. While all candidates should be degreed, an MBA is preferred.

In addition to the outstanding career potential associated with a $2.6 billion corporation, Abbott provides an excellent salary and a comprehensive benefits program which includes profit sharing and a stock retirement plan. We are headquartered in an attractive suburban setting on the Lake Michigan shoreline, just 30 miles north of Chicago. For prompt consideration, submit a resume with salary history, in complete confidence to: **Robert Levy/Corporate Placement.**

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DALLAS, TEXAS

Geophysical Data Center

Our Geophysical Data Center based in Dallas, boasts some of the most advanced computer hardware for seismic data processing and display. We are presently seeking the following professionals to join in Sohio's effort to establish itself as an industry leader.

Geophysical Software Professionals

Several openings exist in the following areas:

- **Seismic data processing software development**
- **Geophysical mapping and data base software development**
- **Geophysical applications software development**
- **Operating systems software and communications software specialists**

Expertise in one or more of the following areas is highly desirable:

- **At least 2-5 years geophysical software development experience**
- **DISCO seismic processing software experience**
- **Software development on minicomputer systems (DEC desirable)**
- **Scientific software development on vector processors**
- **Interactive graphics software development**
- **DEC VMS or TOPS 20 operating systems experience**

Candidates should possess a BS advanced degree in Computer Science, Mathematics, Geophysics, Physics, Electrical Engineering, or a related field.

HOUSTON, TEXAS

Commercial Data Processing Center

We have recently established our Commercial Data Processing Center in our Houston Headquarters offices. As a result, we are seeking MIS professionals to support our state-of-the-art IBM environment. We are presently seeking:

IBM Systems Programmers MVS/JES 2

Applicants must have at least 5 years sytems programming experience in 5 or more of the following areas:

- OS/MVS
- JES 2 and/or JES 3
- IMS
- CICS
- DL/1
- VSAM
- SNA-SDLC
- VM
- VM/CMS
- DBMS
- TSO

These immediate opportunities require highly competent, creative and dedicated individuals capable of developing and maintaining a depth and breadth of knowledge in the areas described.

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Dallas, Texas 75240
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SOHIO

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Binghamton, NY 13901
(607) 772-1888

SYSTEMS PROGRAMMER/ANALYST

Our computer center operates DEC20/60 to fulfill instructional and scientific data processing requirements. The Systems Programmer/Analyst must be able to supervise and interact with student programmers and employees, direct program conversion efforts and communicate effectively with faculty and staff.

A BS in computer science is desirable and 2 years experience in TOPS-20 and MACRO and programming of the systems level is required.

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Requires accomplished programmers with BS/MS in Computer Science or related field. Opportunities exist for: **Compilers • Operating Systems • Software Development Environments • Database Management Systems • Networking • Simulation • Modeling • Statistical Analysis • Computer Architecture.**

Senior Systems Programmers

Requires 2-3 years programming experience on microprocessors. Assignments on intelligent workstation.

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Candidate should have working knowledge of computer concepts, including programming, database design, and information systems. BS in Computer Science, Business Administration or Information Systems.

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Must have working knowledge of computer concepts, including programming, databases, information systems, hardware configurations, and data communications. Exposure to state-of-the-art technical knowledge and business systems in manufacturing environment also required. BS/MS in Business Administration or Information Systems.

Support Systems Programmers and Analyst

Applicants with 2-3 years experience in support positions, please apply. Requires accomplished programmers with exposure to high level languages and operating systems. BS/MS in Computer Science or related field or equivalent experience.

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Requires data processing background. BA/BS in related field or equivalent experience. Will be responsible for developing and writing user documentation.

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Responsible for evaluating and qualifying new computer mainframe designs before release into production. An excellent opportunity for quality-conscience engineers to become involved with all phases of product development cycle. Will participate in design reviews, prepare qualification test plans, evaluate designs and monitor field performance of product in user environment. Requires BS or MS in EE or CS and experience in computer evaluation, design, test or programming.

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Position requires a working knowledge of both software and digital hardware design. BS/MS in electrical/computer engineering or equivalent experience. Opportunities exist in Diagnostic Programming, Microprocessor Based Design, and Computer Aided Engineering or Design (CAD).

For confidential consideration, send your resume to: **Professional Employment, Dept. CW003, 460 Sierra Madre Villa, Pasadena, CA 91109.**

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For confidential consideration, send your resume to: **Professional Employment, Dept. CW002, 25725 Jeronimo Road, Mission Viejo, CA 92691.**

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Memphis:

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TECHNICAL PUBLICATIONS/ DOCUMENTATION

Should have 6-10 years' experience generating technical operations and maintenance manuals, drawing upon your thorough understanding of commercial and military specifications, strong background in digital and analog theory, and detailed knowledge of writing, formating and coordinating document production efforts

INTEGRATION AND TEST ENGINEERS

Prerequisites include at least 3 years experience in an integration and test environment, working with processing subsystems that are computer based Should have BS or equivalent in engineering, physics, math or computer science

Will be responsible for development and implementation of test plans and procedures, conduct of corresponding tests, and preparation of test reports

SYSTEMS ENGINEERS

We're seeking individuals with 9 to 10 years of aerospace or electronics engineering experience, during which at least 6 years were devoted to systems engineering. You should have developed first-level management skills and be ready to assume responsibility for the integrity of major subsystems. Will work closely in planning system activities and developing requirements/specifications Activities will extend to integration and test of subsystems and systems MS preferred.

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These posts call for individuals with engineering or test backgrounds in hardware, software, or system interface Knowledge of computer systems a definite asset, with emphasis on DEC or SEL mini's. Familiarity with communications specifications, standards and devices desirable. You will participate in requirement development, evaluate system design as it evolves, make recommendations for improvement, and move with the system into integration and test phases, with diverse travel requirements.

PROGRAMMER/ANALYSTS

Positions require training and experience with DEC VAX, PDP-11 series hardware, TSX-11D/M and VMS operating systems, UNIX, DEC PDP-11, FORTRAN and Assembly Language Training in top down design, design analysis, and structured software is also desirable You will be performing detailed design, development, and programming of real-time software, working from specifications You will also participate in the translation of requirements into system concept and assist in the development and documentation of hardware/software interface definitions.

SOFTWARE ENGINEERS

Prerequisites include at least 10 years of related experience in computer science, exceptional knowledge in a specified field of computer application, ability to work without technical guidance as you analyze, synthesize, determine and recommend designs and processes to be used in or with existing or new systems.

Your responsibilities will include translating user requirements into systems concepts employing the effective use of hardware and software, developing and documenting hardware/software interface definitions, performing design studies for timing analyses, computer configuration, peripherals selection or design, and providing technical leadership in complex systems analyses involving real time and non-real time computing systems

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Must have at least 8 years' direct experience in design and development of real-time software systems for such functions as hardware control, data base management, information display, scientific analysis, and communications. Experience with DEC PDP-11 series hardware desirable. Your responsibilities will include translating software requirements into structured software design, defining software interface requirements and data base structures, providing technical review and guidance to software engineers, designers, and programmers involved in top level and detailed development and installation of structured software.

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Must have BS or equivalent in training-related curriculum, electronics, computer science, digital systems, and two to four years experience in computer systems, maintenance and one to two years training experience using the systems approach to training (SAT, [illegible] or ISD). Knowledge of DEC or SEL [illegible] puters and peripherals desirable.

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Ford

Ford Aerospace & Communications Corp[illegible]
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Well-known computer research & development group working on state-of-the-art computer graphics systems, audio systems and film technology seeks individual to lead newly formed commercial software project. Project will include CAD software for circuit design, graphics systems, and DBMS applications. UNIX and C experience are a must. 3 to 5 years project management experience required. Developed interpersonal skills, ability to operate in an R & D environment, flexibility and willingness to take on a challenging assignment are all essential. Send resumes in confidence to Ms. Lisa Ellis, P.O. Box 2009, San Rafael, CA 94912.

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Mgr. of plans, controls, Q.A., & training skills needed by large IBM client, degree, good track record and life exp. Industry req'd. Executive position leads to VP level. To low $40's.

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Experience in a large scale IBM environment with moderate command of MVS/JCL, UTILITIES & ABEND resolution. Excellent benefits & career apply. Exposure to VSAM, TSO/SPF and VCC desirable. Resumes accepted until May 20, 1983.

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A Dynamite Opportunity to apply your skills to the real world!

Mergenthaler is an international leader in the innovative design and development of computerized phototypesetting equipment and systems. Explosive growth has created several challenging career opportunities for professionals.

These positions should be of interest to you if you're interested in applying your knowledge of UNIX*, local area networks, communication protocols, graphics, DBMS's, or 16-bit microcomputers to the real world—worldwide!

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And, if you're looking for a chance to become involved in all stages from product conception right through to seeing your work installed at the customer's site, Mergenthaler's your kind of company.

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You can even advance your career through either management or technical stages with recognition and tangible rewards such as salary advancement and outstanding benefits. It's all here within a dynamic, international environment. And you can be part of the excitement!

The first step is to send your resume in confidence to: **Robert A. Pecsik, Director, Human Resources, Department C, Mergenthaler Linotype Company, 201 Old Country Road, Melville, New York 11747.** We are an equal opportunity employer m/f/h.

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APPLIED DATA RESEARCH, the world's oldest and largest independent systems software products company, is seeking software professionals for employment in Dallas or Princeton with experience in one or more of the following:

Software Development
- IBM systems software development using IBM Assembler and Macro Language
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- Systems software positions available for both entry level and experienced in software product support.

For confidential consideration send a resume to Mr. E.D. Smith, Director of Technical Recruiting, APPLIED DATA RESEARCH, INC., Route 206 & Orchard Rd., CN-8, Princeton, NJ 08540.

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At Wang, we've got the best team in the country in the best environment going. Prolific product development nurtures your work. And R&D participation in all phases of product development produces excellent products – like the Wang VS, the Digital Voice Exchange (DVX) and our new Alliance™ system.

There's room on our team for a few more of the best we can find to join us in developing future generations of Office Automation products.

SYSTEMS SOFTWARE DEVELOPMENT

VS DEVELOPMENT

The Wang VS System is a 32-bit interactive virtual memory integrated information system supporting data processing, word processing, and image processing in a fully distributed environment. The VS Development Group is responsible for present and future direction in application generators, workstations and terminals, information storage and retrieval, operating systems, interconnects, and networks.

LANGUAGES AND TOOLS

Languages and Compilers

Help develop our next generation of compilers. Design, develop, enhance and support compilers including C, PL/1, COBOL and Fortran. Produce front ends using modern technologies. Develop optimizers, code generators, and run-time systems for target systems including 32-bit VS and 16-bit microprocessors. Offers technical challenge and growth to individuals with knowledge of compiler construction and modern software development techniques, and experience in system software development and implementation of block structured languages. BSCS or equivalent experience.

RPG-II Experts

Contribute to a development effort enhancing and extending the Wang VS RPG-II compiler. Work in a small team environment to build reliable, maintainable compilers and productivity tools for programmers. Requires solid knowledge of RPG-II as an applications developer, varied design and implementation experience, some exposure to systems programming and special interest in the future of RPG. Experience with Assembler is a plus.

Software Tools

Propose and implement major new products to improve high-level language programming productivity. Be involved with documentation generation, debuggers, editors, test case generation and other program development aids. Senior level position requires extensive experience in system software design and development, with emphasis on human engineering and language support.

DBMS

Senior Software Engineers

Primary design and implementation responsibility for major architectural components of our Integrated Data Dictionary, Extended B-tree File System, Transaction Locking and Recovery System, Forms Management System, Relational Query Language, DBMS run-time system, or our non-procedural Application Generator. Requires 3-7 years' experience in systems software development. Applications development experience a significant plus. MS in Computer Science or equivalent experience.

Section Manager, Data Dictionary

Provide administrative, design and technical management for our Integrated Data Dictionary Project. Requires an exceptional level of knowledge in data modeling, information management, and data dictionary concepts. Project leadership background and a minimum of 7 years' experience in database management systems development necessary.

DISTRIBUTED SYSTEMS

Distributed Processing System is planned as a building block for the next generation of Wang office and data processing products. It will combine a network operating system with a distributed access relational database management system to provide state-of-the-art solutions to data distribution, retrieval, and archiving, all in the WangNet environment.

The hardware is a new loosely-coupled multiprocessor that incorporates high speed virtual memory 32-bit microprocessors. Software will be written in C.

Network Operating System Development

Principal and senior software engineers to participate in the design and implementation of a fully distributed network operating system. Work includes file directory management, user authorization and security issues, network topology control, data archiving systems, and network node initialization. Requires a minimum of 3-5 years' experience in operating systems development, networking or distributed processing. BSCS or equivalent.

Kernel Operating System Development

Assist in the design and implementation of a virtual memory message-based multitask kernel operating system. Principal and senior software engineers are needed to work on basic task control, demand paging of virtual memory, task address space control, intertask message systems and multitask debuggers. Requires BSCS and a minimum of 3-5 years' experience.

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WANG

The Office Automation Computer Company

Focus On Your Future With Tektronix

Engineering Computing Systems, a recently formed business unit, is responsible for the design, development, manufacture and marketing of a complete line of engineering work stations.

We are currently seeking several key individuals to join our organization. Listed below are a brief description and requirements for these key positions. In addition to the initial responsibilities listed, these positions provide high visibility and career paths to greater responsibility in both the technical field and management.

Manager— High Performance Application Development

Responsible to plan, organize and direct a high performance CAD workstation application group. This will include the development of overall strategies, programs for evaluating and acquiring application software and direct application software product implementation projects of considerable scope and complexity.

This position requires strong management skills, knowledge of CAD application and high performance application software and knowledge of systems, applications, networks and data base systems.

Software Application Engineers

Will identify engineering applications requirements, develop software application acquisition strategy, identify and qualify software vendors, and extend, modify, port and benchmark applications to run on Tek's line of engineering computing systems.

This position requires experience developing software products in both a lead and individual contributor role, familiarity with requirements analysis and third party software marketplace, knowledge of UNIX™, CPM, PASCAL, C and FORTRAN and experience proposing and developing product concepts.

Senior Software/Hardware Engineer

Provide technical leadership for an integrated set of engineering software products. This responsibility will include setting the technical direction in the areas of user interface, applications integration, the selection determination of products and functionality for products focused at CAD EE workstations as well as directing a group of engineers in the implementation of this direction.

This position requires prior experience in the design of user interfaces, a lead role in the design and development of a major software application product, experience with UNIX™ and the ability to focus product requirements across products and markets.

We offer a team environment where the individual is important with a company recognized for technical leadership in the fastest growing segment of the computer marketplace and in a location recognized as one of the United States' most desirable from a quality of life perspective.

If you would like to explore these start-up opportunities, forward your resume to:

Technical Staffing Manager
Engineering Computing Systems
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Software Systems Opportunities

With a Johnson & Johnson Company

Ortho Pharmaceutical's progressive approach to developing and applying highly advanced state-of-the-art technology to the solution of complex business problems has created opportunities for the following professionals

SYSTEMS ANALYST/ SR. SYSTEMS ANALYST

Positions require 3-7 years of business experience in programming or systems including heavy user interface. Good written and verbal communications skills required to liaise between user department and data processing. Strong technical skills essential to translate business problems into technical solutions

In addition, Senior position requires a bachelor's degree or equivalent experience, and the ability to provide independent support for large scale projects

PROGRAMMER/ SR. PROGRAMMER

Positions require 2-7 years commercial programming experience and a thorough knowledge of COBOL. College degree or equivalent experience is preferred, familiarity with DL/1 is a strong plus

Responsibilities include reviewing specifications, developing technical designs, writing, modifying programs for solution of general business problems. Excellent technical prowess required to recommend procedural changes and provide tech support

Ortho Pharmaceutical Corporation, a Johnson & Johnson Company, enjoys preeminence in the health care industry. Located in Raritan, New Jersey we offer close proximity to the cultural attractions of New York City and Philadelphia. New Jersey is an ideal place to live and work. Additionally, we're proud to offer highly competitive salaries and the comprehensive benefits you'd expect to receive from a leader in its field. Candidates for these positions should forward resume with salary history to **Personnel Dept. CW, Ortho Pharmaceutical Corporation, Route 202, Raritan, New Jersey 08869.**

ORTHO

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(Chicago Area)

We need Software Engineers for our Systems Products Division. This system greatly improves productivity of information system developers. You should have experience in the following areas:

- On Line interactive applications design
- High level language capability (PASCAL, COBOL, C and PL1)
- Compiler design
- Generation of application data dictionary system
- Structured design and programming

Degree preferred but not required. Salary to mid $40's. Interviewing and relocation expenses paid. Send resume to:

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Engineering

The CSC Software & Systems Career Alert

COMPARE OUR GROWTH, OUR STANDARDS AND OUR OFFER

Examine the facts. Computer Sciences Corporation is the world's largest information services company. We're growing at a rate of 25% annually. Our Defense Systems Division is setting the standards and creating the prototypes for the industry at large. To add to our growth and standards, CSC has an exceptional offer for Software/Systems Engineers who want to work on a variety of sophisticated and technically challenging projects in a real-time environment. Excellent compensation. Rapid advancement potential — part of a formal career development program. The best of working environments, and where appropriate, an exceptional "total cover" relocation package.

Computer professionals who would like to advance their careers should consider the following outstanding opportunities. For immediate and confidential consideration, please call or send your resume to the individual in the location listed below that matches your interest and experience.

MOORESTOWN, NJ

Call Marlene Levick COLLECT at (609) 234-1100, or forward your resume to her attention at: CSC, Defense Systems Division, P.O. Box N, Moorestown, NJ 08057.

Participate in the development of the world's most advanced shipboard decision-making combat systems, sophisticated simulation/wargaming systems, or state-of-the-art microprocessor technology.

- REAL-TIME SOFTWARE
- SCIENTIFIC APPLICATIONS
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- OPERATING SYSTEMS
- MODELING & SIMULATION
- MICROPROCESSOR APPLICATIONS
- SEL, CP-901, CDC-CYBER

HUNTSVILLE, AL

Call Betty Campbell COLLECT at (205) 837-7200, or forward your resume to her attention at: CSC, Defense Systems Division, 200 Sparkman Drive NW, Huntsville, AL 35805.

You'll be involved in the design, development, implementation and test to support a high-speed passenger system for the Department of Transportation; or provide the system engineering support in tactical missile systems to include tracking technology, guidance systems, development tests, and instrumentation systems

- CONTROL SYSTEMS ENGINEERING
- EW SYSTEMS
- SIMULATION & MODELING
- DIGITAL HYBRID & HW-IN-THE-LOOP SIMULATION
- TAL, FORTRAN, ASSEMBLY

DAHLGREN, VA

Call Dan Hickman COLLECT at (703) 663-9251, or forward your resume to his attention at: CSC, Defense Systems Division, 38 Danube Drive, King George, VA 22485.

Working in conjunction with our Moorestown, NJ facility, opportunities are available for computer professionals with experience in any of the following:

- REAL-TIME SOFTWARE
- CMS-2
- OPERATING SYSTEMS

RED BANK, NJ

Call Rosemarie Celley COLLECT at (201) 747-6886, or forward your resume to her attention at: CSC, Defense Systems Division, 10 Highway 35, Red Bank, NJ 07701.

Participate in the design and development of advanced C^3 systems.

- ADA, PASCAL, PL/1, ALGOL
- TACTICAL C^3 SYSTEMS ENGINEERING
- MILITARY COMM NETWORKS
- SOFTWARE DESIGN & DEVELOPMENT

All candidates should have a BS degree in Computer Science, Electrical Engineering or a related discipline, and experience in any of the above areas. U.S. Citizenship is required.

Computer Professionals . . . Contact Arlene Sidney, Personnel Consultant immediately if you are attending the National Computer Conference the week of May 16th to schedule a confidential local interview.

Interviews will be held in the local Anaheim/Irvine area. Call TOLL-FREE 1-800-872-9287, Ext. 909.

If you are unable to call, mail resume or write: A. Sidney, Personnel Consultant, CSC, Defense Systems Division, P.O. Box N, Moorestown, NJ 08057.

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Current Beehive opportunites exist for:

Manager Software Development

Manages software development group responsible for production of computer system software and applications. May coordinate software development with external organizations.

The successful candidate will have a minimum of three years experience in software management, including operating systems and communications. Knowledge of UNIX operating systems preferred.

Senior Programmer

For this position we require a minimum of three to five years experience and a BSCS degree or equivalent. Combined experience in UNIX or C, Ethernet, SNA, X.25, M68000 assembler language, firmware, hardware, diagnostic programming languages and DBMS is highly desireable.

Microprocessor Programmers

These senior level positions involve firmware and software development for all facets of this rapidly growing industry. These positions require experience with 68000 microprocessors, as well as a strong background in communications or terminals, 3-5 years experience with design code software for CRT based products. C-language and UNIX is desirable. Additional experience with firmware operating systems and terminal evaluation packages is strongly recommended. Positions require a BSEE or equivalent experience.

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Personnel Department
P.O. Box 25668
Salt Lake City, Utah 84125
Telephone Toll Free: (800) 453-9454

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Programming

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We seek talented self-starters with vision to develop effective on-line office products and proven ability to engineer high-quality software in a multiprocessing environment.

Our financial information services include the opportunity for professionals to participate in the design and development of on-line systems which service the most prestigious national financial marketplaces. Positions require assembly language programming in communications, database and display applications in a multiprocessor configuration.

Our office automation products include openings for UNIX* Systems Programmers with a background in multiprocessor architectures, compiler implementation, intelligent controller firmware development, local area networks and X.25/SNA communications.

We offer a competitive starting salary, excellent company benefits package, and a congenial work environment in Marina del Rey. Please send resume or call:

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P.O. Box 66914
Los Angeles, CA 90066-0914

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SENIOR SYSTEMS ANALYSTS
SENIOR SOFTWARE ENGINEERS

The Space Telescope Science Institute has openings for several senior and intermediate level computer professionals. ST ScI, located at Johns Hopkins University in Baltimore, is a major international center for research in the field of astronomy. The Institute will be the site for scientific operations involving planning, scheduling, data acquisition and analysis for the Space Telescope, which is scheduled to be launched by the Space Shuttle in 1986. ST ScI is an academic research organization under contract to NASA.

Applicants must demonstrate a thorough knowledge of systematized approaches to large scale problem solving, software system development, and interactive data reduction techniques. Direct experience with real-time data acquisition, multi-processor or networked systems, image processing, or distributed database systems will be of interest. Successful candidates will possess, preferably, a Bachelor's degree in Computer Science, Physics or related field. We are seeking individuals who are able to work closely with scientists to develop flexible systems that meet their needs; but most importantly, applicants must have a true commitment to excellence. The successful candidates will have the unique opportunity to develop technically challenging systems in an atmosphere that provides the freedom to solve difficult problems in innovative and creative ways.

ST ScI offers an atmosphere of intellectual stimulation and reward, coupled with a competitive salary and benefits that includes 24 days paid vacation; employer paid pension, BC/BS, MM, and dental insurance; and relocation assistance.

Submit resume, salary history, and a portfolio of your work showing both program and design and documentation to: Steven Mantegna, Personnel Officer, Homewood Campus, Baltimore, MD 21218

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An Equal Opportunity/Affirmative Action Employer M/F/H

PROGRAMMER

Needed to convert symbolic statements of financial data and business problems to detailed logical flow charts for coding into computer language. Center with personnel of organizational units involved in accounts specific output requirements, such as types of breakout, degree of data summarization, and format for management reports. Specify in detail logical and mathematical operations to be performed by various equipment units and comprehensive computer programs, and operations to be performed by personnel in systems. Requires a Bachelor of Science Degree in Computer Science or Systems Analysis with one year of experience in job being offered. Will consider additional experience equivalents, in lieu of Degree in lieu of experience. Must be thoroughly knowledgeable in COBOL computer programming language. Must have thorough knowledge in computer/financial concepts and their related programming applications. Must also have familiarity with banking principles. Forty hour work week. $1680 per month. Apply at the Arkansas Employment Security Division, P.O. Box 340-C7, Little Rock, AR 72203. (501) 371-2557. Ad paid by an Equal Opportunity Employer.

DIRECTOR OF INFORMATION SYSTEMS
MILWAUKEE PUBLIC SCHOOLS

Responsible for all Information System activities, including application development and maintenance, operations, data administration, system and user training and data and word processing equipment services for a school system with 130 sites. The Director is responsible for a staff of 50 and a budget of $2 million. Requires Bachelor's Degree in Computer Science, Business Administration or Engineering and 5 years of significant managerial experience in data processing with emphasis on planning and directing information system activities. Salary range: $35-$40K, plus excellent benefits. SEND RESUME or call for application information: Steve Sachs, CITY OF MILWAUKEE PERSONNEL, BOX 036, Room 706, City Hall, 200 East Wells St., Milwaukee, WI 53202. (414) 278-5200.

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Hardware & Software Professionals:

Parker Brothers Challenges You To Game Engineering

Parker Brothers has made a major corporate and engineering commitment to the future of video games and other electronic home game entertainment. We're shooting for a large share of 1983's anticipated market of 80-90 million video game cartridges. And our outstanding success in 1982 — capturing $115 million in sales with only 4 game cartridges — should tell you just how successful we plan to be. We now seek qualified engineers for the development of home entertainment products.

SOFTWARE

Project Manager External Resources

A key management position, performing technical coordination and direction of external resources in the development of video game software. Position is responsible for overall management of outside contractors, providing technical guidance and support and ensuring that the outside work meets Parker Brothers' standards. The ideal candidate will have a BSEE/BSCS or equivalent, a minimum of 5 years' experience in microprocessor, real-time programming, and project management. Some travel required.

Project Manager Video Software Development

Providing management and technical leadership, you will be responsible for the development of software implemented on a variety of home computers and video game systems. You will be responsible for managing several engineers in developing game software while acting as liaison between Marketing and Technical personnel to ensure timely completion of the best product possible. The ideal candidate should have a BSEE/BSCS or equivalent, a minimum of 5 years' experience in microprocessor real-time programming, and project management experience. Graphics, personal computer or game experience a plus.

Verification and Release Manager

You will manage the overall process of evaluating and qualifying new software products before release to manufacture. Responsibilities will include technical leadership and supervision of software engineers in the testing of the software products, ensuring product quality and integrity. You will be working closely with the Product Development team and Manufacturing in order to make our high volume operation run smoothly. The ideal candidate should have a BSEE/BSCE or equivalent. Experience in the Test Engineering area a plus. Microprocessor real-time programming background a must, as is a minimum of 2 years' management experience.

Project Manager Preliminary Design Support

You will manage and provide technical leadership for a software support group. This group provides software support to inventors of video games and educational products, ensuring efficient implementation of game concepts. The ideal candidate will be a creative thinker, with BSEE/CS or equivalent, 2-4 years' management experience, and knowledge of both high level and assembly programming languages.

Sr. Software Engineers Applied Technology / Video Game Development

We seek engineers with software experience in microprocessor-based products to work in all aspects of video game software and applied technology. You should have a BSEE/BSCS or equivalent with at least 3 years' experience in real-time assembly programming.

Sr. Software Engineer Development Tools

You will be responsible for the design, implementation and debugging of microprocessor-based systems to be used in game design, mainframe communication, and remote software debugging. The ideal candidate will have a BSEE/BSCS or equivalent and both assembly and high level language experience. A familiarity with DEC processors and 8-bit microprocessors preferred.

HARDWARE

Project Manager Electronic Systems

Responsible for technical coordination and direction in the development of Parker Brothers' new ventures into the home entertainment area, this Manager will be a senior technical contributor, and manage the overall process of developing products up to manufacturing. The ideal candidate will have a BSEE/MSEE and 5 years' minimum digital/microprocessor experience, including 2-4 years' management experience.

Sr. and Principal Engineers Applied Technology

Responsible for identifying and applying new technologies to home entertainment. Duties include system design, analog and digital design, software, and applied research. The ideal candidate will have a BSEE and a minimum of 4 years' experience in digital microprocessor design. Knowledge of assembly language, high level language, RF, and integrated circuit design essential.

Sr. Product Support Engineer

This individual will act as liaison between Product Development and Manufacturing. Responsibilities will include re-design of existing electronic products, as well as technical analysis and problem-solving to make electronic hardware and software more reliable. You should have a BSEE or equivalent and 4 years' experience in test engineering and/or product support. Microprocessor experience preferred.

Sr. Engineer Electronic Systems

In this position you will be responsible for overall hardware design of microprocessor-based video products. Duties will include system/subsystem design, hardware/software tradeoffs, documentation and testing. Candidate must have a BSEE, with a minimum of 4 years' experience in digital/microprocessor design. Assembly level programming and analog experience is essential. RF and video circuit design desirable.

Come To The Technical Career Job Fair!

CAREER JOB FAIR

Come talk to our Technical Managers.

We will be at the Technical Career Job Fair at the Sheraton Anaheim, 1015 W. Ball Road on Monday, May 16 and Tuesday, May 17 from 11 AM to 9 PM. Drop in and find out about Parker Brothers' excellent compensation and benefits package and the exciting video game projects you'll be working on at Parker Brothers.

If you are unable to attend, please send your resume, in confidence, to Nancy Thibedeau, PARKER BROTHERS, Dept. CW 516, 50 Dunham Road, Beverly, MA 01915. Or phone (617) 927-7600. We are an equal opportunity employer M/F.

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SOFTWARE SUPPORT SPECIALISTS/TEAM LEADERS (VAX/VMS, Networks, DECSYSTEM 20, TOPS-20)

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We'll provide you with virtually unlimited technical resources. Give you the chance to work with the next-generation computer products—in an environment that consists of multiple VAX/VMS systems connected via DECnet to several TOPS-20 and PDP-II systems. Assignments also offer exposure to such advanced concepts as ETHERNET, CI, COMMS and NETS, and distributed processing.

In short, you'll have the opportunity to build one of the most sophisticated computer centers in the world. And your success will bring all the personal and professional rewards you'd expect from a world leading computer company.

Write to us this week if you qualify.

TEAM LEADER (VAX/VMS)

Will have overall responsibility for operating systems and support of layered products for multiple VAX/VMS systems. Position will involve leading a team of support specialists whose primary goal is providing high performance/reliability for all installed VAX systems. Duties include planning new systems installation, implementing new operating systems and features, and system tuning. Position requires at least 5 years of operating systems support experience in an engineering or service bureau environment where the key objective is effective customer service. At least 2 years of VAX experience also required.

NETWORK MANAGER

Will lead a team of support specialists involved in providing a highly reliable network which delivers best achievable performance. Duties include topology planning, performance measurement/analysis, network troubleshooting, and interface with data center users to define new system implementation. Requires at least 5 years of experience with operating systems support and maintenance, preferable in an end user environment. Ideal candidate will have 2 or more years of DECNET experience in a VAX and DECSYSTEM 20 environment.

TEAM LEADER AND SOFTWARE SPECIALIST (DECSYSTEM 20/TOP-20)

Team leader will be responsible for providing high performance/reliability for all installed TOPS-20 systems.

Software Specialist will contribute to operating system/support of layered products for multiple DECSYSTEM 20/TOPS-20 systems.

Both candidates will be involved in planning new systems installations, operating systems and features, and conducting performance analysis and system tuning.

Positions require at least 2 years of operating systems support experience in an engineering or service bureau environment. At least 2 years of TOPS-20 experience also required. DECNET experience, team leader background or operational experience in either a VAX or TOPS-20 environment preferred.

To apply, please send your resume and salary history to:

Jerry West, Digital Equipment Corporation, Department 0516 3804, 200 Forest Street, Marlboro, MA 01752.

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digital

TRAILBLAZERS WANTED.

GTE has embarked on an exciting journey into the future of information processing. We are developing and integrating network-deployed information systems to provide business and industry with complete voice, image and data communications capabilities.

Consequently, we need more of America's best thinkers: scientists, engineers, R&D specialists and others who are exceptional. People ready to join minds with other exceptional thinkers, already blazing trails into the future. People who relish high technical challenge. People who thrive on opportunities to think, imagine, create, innovate and lead.

Career opportunities exist for top individuals in the following areas:

- *Information Systems Architectural Design*
- *Distributed Data Base and DDP Technologies*
- *Data Base Management Systems*
- *Data Communications Networks*
- *Voice/Data/Image/Graphics*
- *Mathematical Modeling and Simulation*
- *Fourth Generation Data Processing Technologies*
- *Software Engineering*
- *Digital Communication Systems*
- *Office Systems*
- *Network Administration*
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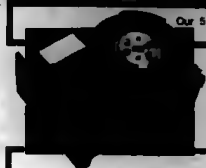

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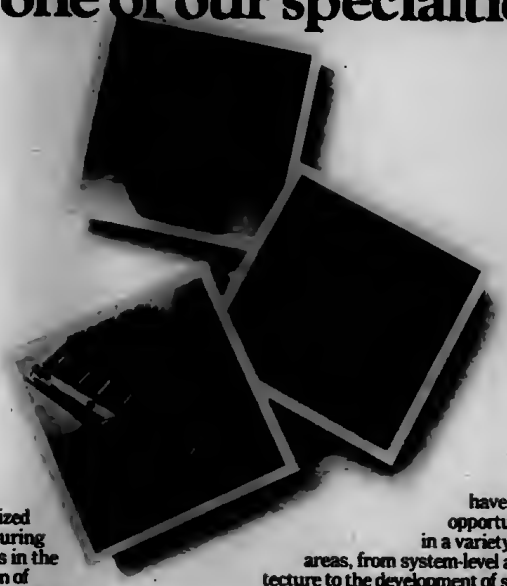

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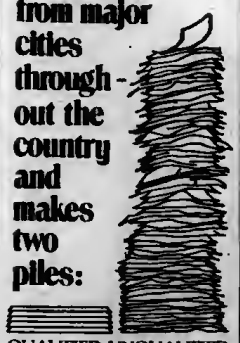

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VM/CMS Systems Software Developer will develop and maintain VM/CMS systems software for internal applications and Institute Program Products. Applicants must have a minimum of one year's experience as an OS/VS1 or OS/MVS systems programmer, and one year's experience as a VM/CMS systems programmer as the most recent job experience, including writing SVC traps, I/O traps, and applications requiring knowledge of the VM/CMS assembler macros. Candidates must possess excellent assembler language knowledge and use assembler as the primary programming language. A working knowledge of PL/I and SAS software is also desirable. A bachelor's degree, preferably in computer science, and excellent communications skills are required.

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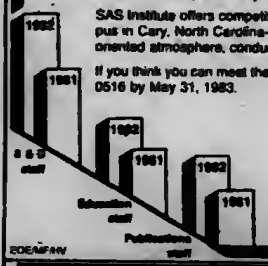
MVS Systems Programmer will support MVS and MVS/XA systems software and related products on a 3083 processor. Duties include installing, maintaining, enhancing, and modifying IBM and OEM vendor software products; working with operations personnel in problem solving; and providing assistance to internal users. Applicants must have a minimum of five years' systems programming or technical support experience with three years as an MVS systems programmer. Experience with SMP and technical proficiency in assembler language are required. Experience with JES2, TSO, and ACF/VTAM is highly desirable. Knowledge of PL/I and IMS/VS or CICS/VS is a plus.

DOS/VSE Systems Programmer will support DOS/VSE systems software and the conversion and maintenance of Institute Program Products for the DOS/VSE environment, including graphics and full-screen applications. Applicants must have a bachelor's degree and excellent assembler language knowledge. Knowledge of CICS/DOS/VS is a plus. IBM 3279 or 3287 hardware experience, DOS PL/I experience, and any knowledge of OS/VS and VM/CMS are particularly useful.



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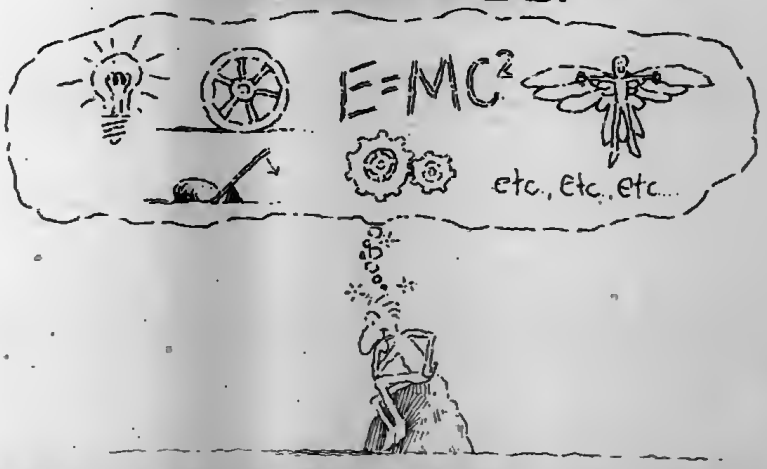

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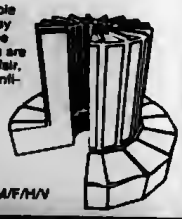

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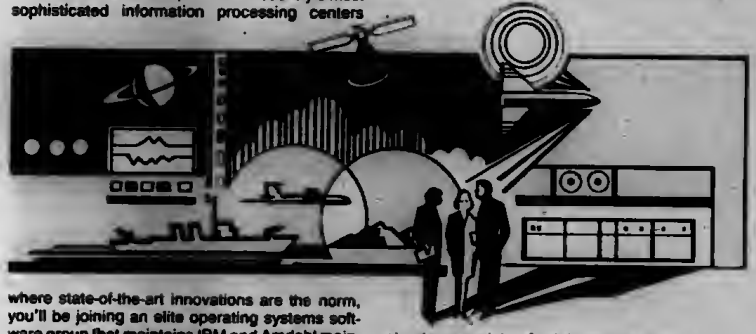

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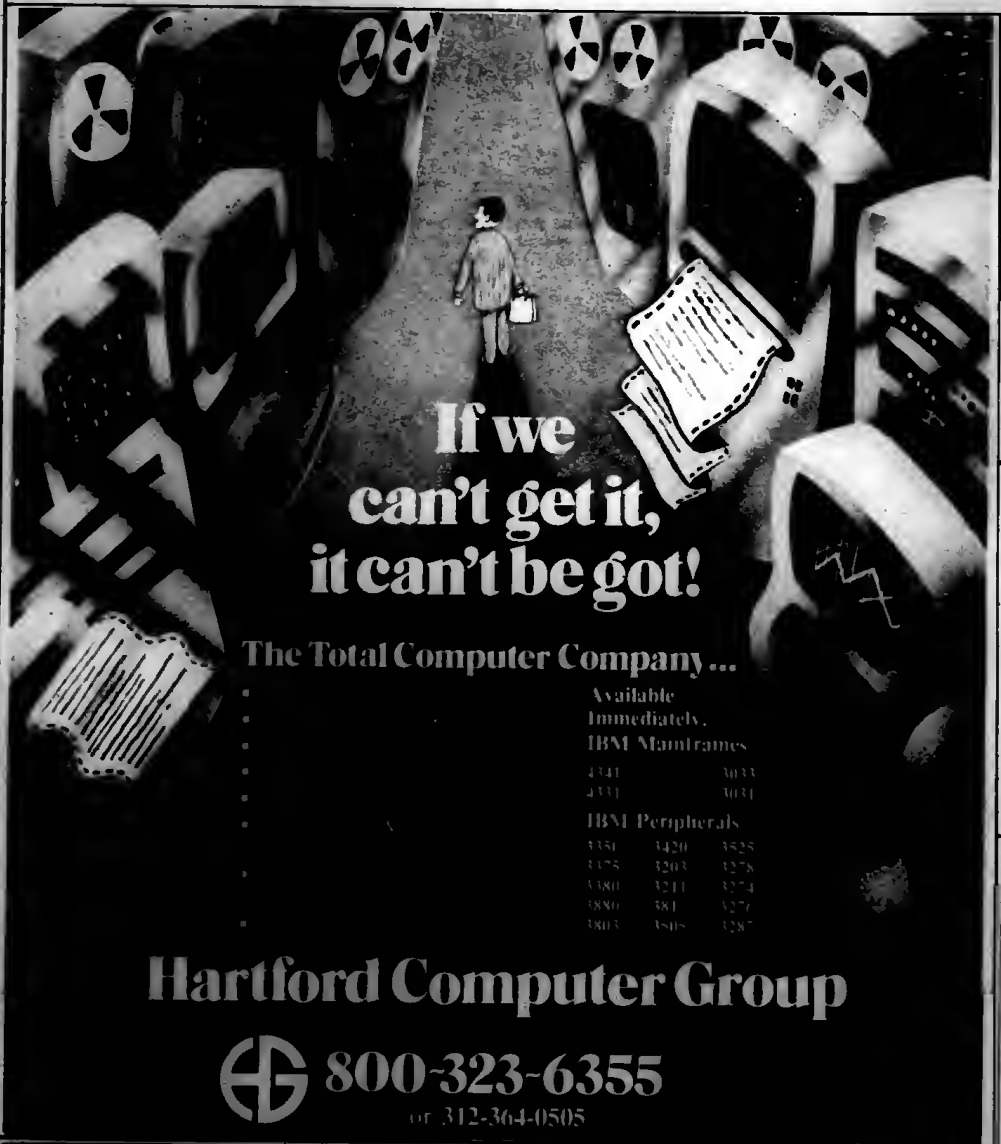

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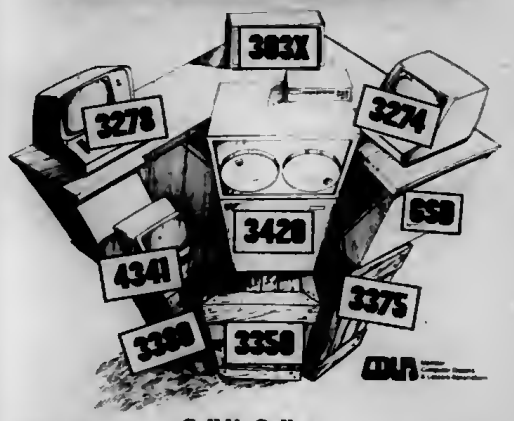

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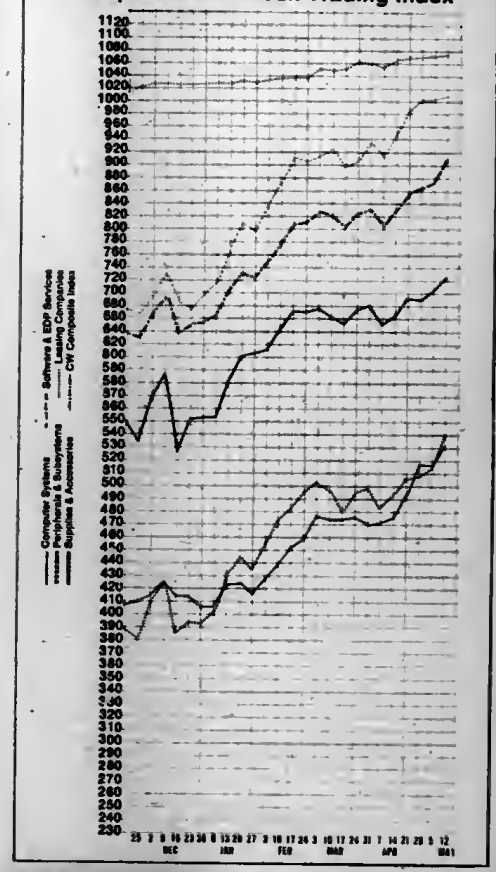

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CLOSING PRICES WEDNESDAY, MAY 11, 1983

All statistics compiled computed and formatted by TRADE QUOTES INC Cambridge Mass 02139

EXCH		1982-83 RANGE (1)	CLOSE MAY 11 1983	WEEK NET CHANGE	WEEK PCT CHANGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	17- 91	39 1/8	+ 1/2	+1.8
N	BURROUGHS CORP	26- 52	38	- 3/4	-1.4
O	COMPUTER AUTOMATION	7- 17	12 1/2	+1 1/8	+9.8
O	COMPUTER CONSOLES	15- 44	42	+3 1/4	+8.6
N	CONTROL DATA CORP	21- 64	54	+6 1/8	+12.7
N	CRAY RESEARCH INC	20- 48	41 7/8	-1 5/8	-3.7
N	DATA GENERAL CORP	20- 73	50 3/4	-5 1/8	-9.06
N	DATAPOINT CORP	11- 38	20 3/8	+1	+5.0
N	DIGITAL EQUIPMENT	62-132	113	-2	-1.7
A	ZECO INC	8- 14	10 3/4	- 3/4	-6.7
N	ELECTRONIC ASSOC.	5- 12	10	+ 7/8	+9.3
N	FLOATING POINT SYST	18- 38	34 1/2	+3 1/2	+11.2
N	FONSONO	22- 63	38 3/4	- 5/8	-1.6
O	FULCRUM CORP GRP	.1- 0	-1/8	0	0.0
N	GENERAL AUTOMATION	3- 12	11 1/2	+1 5/8	+15.8
N	HARRIS CORP	29- 54	44 1/4	+1 7/8	+4.4
N	HEWLETT-PACKARD CO	39- 57	78 1/4	+3 1/4	+4.2
N	HONEYWELL INC	80-123	101 1/8	+2 5/8	+2.6
O	IBM	57-118	110 1/2	+1	+0.9
O	IPL SYSTEMS INC	5- 11	8 1/4	+1 1/2	+18.2
O	MADMUSON CORP SYSTS	3- 8	8	.0	0.0
O	MANAGEMENT ASSIST	7- 18	14 3/4	0	0.0
O	MINI-COMPUTER SYST	1- 3	1 7/8	- 1/4	-11.7
O	MODULAR COMPUTER SYS	5- 18	10 5/8	+1 1/4	+10.1
N	MOHAWK DATA SCI	10- 19	10 3/8	- 5/8	-5.3
O	NCR	35-123	110 1/2	+3 1/8	+2.7
O	PERKIN-ELMER	17- 53	25 3/8	+ 3/8	+1.6
O	PRIME COMPUTER INC	16- 54	29 1/8	+2 1/8	+7.8
N	SPERRY CORP	31- 38	27 1/2	+ 7/8	+2.3
O	TANDON COMPUTERS INC	14- 54	25 7/8	+ 1/2	+1.7
N	TEXAS INSTRUMENTS	71-170	101 1/2	+5 5/8	+3.8
A	WANG LABS "B"	13- 41	26 3/8	+1 1/4	+5.2
A	WANG LABS "C"	11- 41	26 5/8	+1 1/4	+5.3
	LEASING COMPANIES				
O	MONTHE FINANCIAL CP	22- 48	39	+5 1/2	+16.0
O	COMPISCO INC	7- 85	81 5/8	+8	+8.7
O	COMMERCE GROUP CORP	1- 1	1/4	0	0.0
O	COMPUTER INVSTMS INC	1- 3	1/2	0	0.0
O	CONTINENTAL INFO SYS	9- 24	22 1/4	0	0.0
N	DPF INC	8- 14	10 1/8	+ 7/8	+7.1
O	ITEL	1- 8	1 1/8	0	0.0
O	LEASPAC CORP	1- 8	1/8	0	0.0
N	O.E. LEASING	38- 67	39	-1 3/4	-4.7

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O	COMPUTER DEVICES INC	4- 21	19	+ 1/4	+1.6
O	COMPUTER TRANSCEIVER	4- 12	11 1/2	+1 0/4	+17.6
N	COMPUTERVISION CORP	18- 63	41 3/4	+3 1/8	+8.0
N	CONDRAC CORP	21- 38	37	- 7/8	-2.3
O	DATA ACCESS SYSTEMS	1- 4	5/8	0	0.0
O	DATAPRODUCTS CORP	18- 41	23 1/4	+ 1/2	+0.8
O	DATARAM CORP	8- 12	10 1/8	+ 5/8	+3.8
O	DETUR INC	2- 18	13 1/4	+2 1/4	+20.4
O	DAVID JARISON CARLYL	2- 7	3 1/4	+ 1/8	+3.0
O	DECISION DATA COMPUT	3- 18	10 3/4	+ 7/8	+8.7
O	DELTA DATA SYSTEMS	1- 4	4 1/8	+ 1/8	+3.1
O	ELECTRONIC H & M	8- 10	8 0/4	0	0.0
O	EVANS & SUTHERLAND	18- 36	41 3/4	- 1/2	-1.1
O	GANNALF TECHNOLOGIES	10- 22	14 1/4	+ 5/8	+8.8
O	GEN'L DATA COMM INC	8- 34	21 7/8	+1 7/8	+9.3
O	GENERAL TERMINAL CP	1- 2	0/4	0	0.0
O	GREAT SOUTHWEST INC	3- 8	2 1/4	+ 1/2	+28.8
N	HAZELTINE CORP	22- 78	77 3/4	+1 1/2	+1.8
O	ICOT CORP	3- 10	7 1/4	- 0/8	-9.8
O	INFORMATION INTL INC	10- 22	17 3/4	- 1/2	-2.7
O	INTEL CORP	21- 57	38 1/4	+4 3/4	+8.0
O	IPL SYSTEMS INC	5- 11	8 1/4	+1 1/2	+18.2
O	LUNDY ELECTRONICS	7- 18	10 1/4	+ 3/8	+2.8
O	MAI DATA CORP	14- 84	26 5/8	+ 7/8	+8.4
O	NETWORK SYSTEMS CORP	8- 27	24 3/8	+1 3/4	+7.1
O	OMEX	3- 8	6 1/2	+ 1/2	+38.8
O	PARADYNE CORP	20- 38	34 3/8	- 1/2	-1.8
O	PENRIL CORP	7- 13	11 0/4	+1 3/8	+13.2
O	SANTEC CORP	13- 38	23 1/2	+8	+8.8
O	RECOGNITION EQUIP	4- 18	14 7/8	+5	+7.3
O	SCAN DATA	1- 3	1 1/8	- 1/8	-18.1
O	STORAGE TECHNOLOGY	18- 39	22 7/8	- 1/2	-2.1
O	SYKES DATATRONICS	8- 27	8 3/8	+ 1/8	+1.8
A	T BAR INC	7- 14	10 5/8	- 3/8	-3.4
O	IBA PRODUCTS CO	8- 37	37 1/4	+1 1/2	+9.8
A	TEC INC	8- 12	8 0/8	0	0.0
O	TEKTRONIX INC	30- 79	72 1/8	+4 7/8	+7.3
O	TELEX	6- 27	22 1/4	+1	+8.8
O	TESDATA SYSTEMS CP	3- 11	8 0/8	+1	-0.4
O	TIMEPLEX INC	7- 24	21 5/8	- 3/8	-3.8
O	VIRUS TECHNOLOGY	8- 24	24	+3	+8.0
O	WILTON INC	1- 4	3 0/8	+ 1/8	+8.0
	SUPPLIES & ACCESSORIES				
O	AMERICAN BUS FORMS	11- 27	20 7/8	+ 1/2	+1.8
O	BALTIMORE BUS FORMS	1- 8	3/4	0	0.0
O	BARRY DATAPOINT	13- 27	20 7/8	+1 7/8	+7.8
O	CYBERNETICS INC	1- 1	1 1/4	0	0.0
O	DUPLEX PRODUCTS INC	12- 20	20 1/8	- 1/8	-0.6
O	ENNIS BUS. FORMS	16- 28	24 3/8	+1 7/8	+8.1
O	3M COMPANY	46- 38	84 1/4	+3 1/8	+0.3
O	PRICE COMP LTD	36- 81	81	+1	+2.6
O	RADNAN CORP	9- 18	18	+1 1/4	+7.4
O	STANDARD REGISTER	36-130	38 1/2	+2 1/2	+2.0
O	WALLACE BUS FORMS	11- 26	26 1/2	- 3/8	-1.3

EXCH		1982-83 RANGE (1)	CLOSE MAY 11 1983	WEEK NET CHANGE	WEEK PCT CHANGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 8	8	+ 1/4	+3.0
O	ADVANCED SYSTEMS INC	8- 34	28 1/2	+1	+3.8
O	AGS COMPUTERS INC	7- 24	21 3/4	+1	+4.8
O	AMERICAN SOFTWARE	62- 38	27 3/4	- 1/2	-1.7
O	ANACOMP INC	8- 23	20 1/8	0	0.0
O	ANALYSTS INTL CORP	8- 11	10 1/2	+ 3/4	+7.8
O	APPLIED DATA RES.	8- 30	31 3/4	+1 3/8	+4.8
O	ASK COMPUTER SYSTEMS	12- 38	33 1/4	+ 3/4	+2.3
O	ASTROSYNE CORP IBA	1- 8	8 5/8	+ 1/2	+8.7
O	AUTOMATIC DATA PROC	31- 62	41 1/2	+0 3/8	+0.9
O	CGA COMPUTER ASSOC.	8- 14	13 1/2	+1 1/4	+10.3
O	COMPUTER ASSOC INT'L	12- 84	38	+8 1/2	+12.1
O	COMPUTER HORIZONS	8- 22	22	+2 1/2	+12.8
O	COMPUTER NETWORK	4- 19	18 1/8	+ 3/4	+4.8
O	COMPUTER SCIENCES	11- 29	18 1/2	+2	+11.0
O	COMPUTER TASK GROUP	8- 23	23	+1 1/8	+5.0
O	COMPUTER USAGE	2- 23	18 3/4	+3 1/4	+18.8
O	COMPUTONE SYSTEMS	18- 34	21 1/2	-1 1/4	-5.4
O	CONCERN CORP	10- 34	12	+ 3/4	+6.1
O	CONSBANK	8- 13	10 1/2	+ 1/4	+2.0
O	CULLINET SOFTWARE	12- 42	42 1/4	+3 1/4	+8.2
O	CYCARE SYSTEMS INC	8- 24	24	+2 3/4	+12.8
O	DATA DIMENSIONS INC	1- 3	3/8	0	0.0
O	DATATRAN	9- 3	3/8	0	0.0
O	DYSTECH CORP	2- 4	0	- 1/8	+4.8
O	ELECTRONIC DATA SYST	19- 28	63 1/4	-2	-3.8
O	INFORMATICS INC	10- 31	30 1/4	+1 5/8	+5.8
O	IDAYTE CORP	1- 8	1 5/8	0	0.0
O	IPS COMPUTER MARKET.	1- 3	1 5/8	0	0.0
O	KEANE ASSOCIATES	6- 18	11 3/4	0	0.0
O	LOGICON	12- 84	37 1/4	0	0.0
O	MAST MCI AMER INC	8- 81	38 1/2	+8 1/2	+17.3
O	MATHEMATICA INC	13- 23	24	+8	+8.0
O	MATHEMATICAL APP GRP	12- 22	18 3/4	- 5/8	-6.8
O	NATIONAL DATA CORP	8- 38	26 3/4	+1	+4.2
O	PANSOPHIC SYSTEMS	8- 25	23 3/4	- 3/8	-3.0
N	PLANNING RESEARCH	8- 18	18	+1 1/8	+6.8
O	PRLTCY MGMT SYSTS CP	20- 38	38	+1	+1.0
O	PROGRAMMING & SYS	1- 4	0 1/4	0	0.0
O	REYNOLDS & REYNOLDS	17- 84	43 1/2	0	0.0
O	NCI CORP	11- 84	84 1/4	+ 1/4	+0.7
O	SHARED MEDICAL SYST	13- 37	84	-1 7/8	+0.0
O	SCIENTIFIC COMPUTERS	8- 13	12	+ 3/4	+6.8
O	SOFTWARE AG	8- 17	8 5/8	+ 5/8	+7.1
O	TYMSHARE INC	12- 84	22 1/2	+3 3/4	+18.8
O	URS CORP	8- 14	13 1/2	+ 1/2	+3.8
O	WYLY CORP	7- 13	12	- 3/8	-3.0
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	3- 8	8 3/4	+ 1/2	+6.8
A	ANDERSON JACOBSON	8- 28	28 1/2	0	0.0
O	AUTO-TROL TECHNOLOGY	8- 21	17 7/8	+8 1/8	+84.8
O	BANCTEC INC	7- 23	18 1/8	+ 1/2	+3.1
O	BEEHIVE INT'L	6- 18	14 1/4	+2 7/8	+25.3
N	BOLT-BERANEK & NEW	12- 81	38 3/4	+8	+8.8
O	CANBEX CORP	2- 8	8	+ 1/8	+8.8
O	CENTRONICS DATA CORP	8- 31	18 3/4	+ 3/4	+4.8
O	CETEC CORP	6- 18	8 1/4	+ 3/8	+7.6
O	CONSTRUTECH	2- 14	11 1/8	0	0.0
O	COMPUTER COMMUN.	1- 3	1 3/8	0	0.0

15 pointed questions to ask MSA or any software supplier

These questions will help you when you sit down with individual software companies.

They're tough questions. Relevant ones. And any supplier who is worth his salt should be able to answer them without backpedaling.

Ask MSA

We'll answer all these questions to your satisfaction—plus any others you may have.

In fact, we're probably the best equipped to answer them. Because MSA is *the* software company. We offer the most complete line of totally integrated systems in the software industry, including financial, human resource and manufacturing.

So you avoid the headache of trying to tie together individual systems. (And the even bigger headache of adding to them.)

With MSA's integrated systems, there's no unnecessary duplication of data or effort. Reporting is faster. All your company's information is more timely and accurate—and in the right form.

Our technical edge comes from experience

Staying ahead is easier for a company that's steeped in software technology. MSA has spent years developing, refining, testing and enhancing our systems.

This year alone, we'll invest $25 million to make sure all our systems are technologically razor sharp. That gives us a decided advantage over flash-in-the-pan technology that may not have the bug-free logic of a more experienced system.

It also gives you a decided advantage over "custom" systems you have to update yourself.

MSA relieves you of that time-consuming burden. We update and enhance your software for a full year. Then we continue this service for a surprisingly low annual fee.

Maintenance includes keeping your system up-to-date technologically. Enhancing it with new features that make it work even harder for you.

And making sure it reflects changes in accounting procedures and government regulations, including 401(k), TEFRA, and FAS52. (That eliminates a lot of tedious work you normally have to do.)

Save this box. It can help you make an intelligent software decision.

1. Can you offer us a complete range of software systems designed to work together?
Or will we have to piece together a patchwork of systems?

2. Are your systems just record keepers, or can they really help us make decisions?
Can we pull together information from any of our integrated systems? In exactly the form we want it?

3. Can you provide business software for both mainframe and microcomputers?
Do you develop this software yourself or do you simply market it for another company?

4. Are your systems truly online so all of our information is current?
How many of your systems are online? How secure are they?

5. Will my company have to be the one that discovers the bugs in your brand new system?
Just how long have your systems actually been used, and how have they been tested?

6. Will you update your systems as technology advances and regulations change?
What are some of your most recent updates? Will you keep us current on regulatory changes?

7. Do your systems really do everything you say they will?
Or will we have to change them or add to them to get the features we want?

8. How long have you been in business?
What are your revenues? What is your growth record? Where will your company be five years from now?

9. How many systems has your company installed?
How many of these were installed in the past six months? How many of your earlier customers are still using —and liking—your systems?

10. Do your financial systems handle unlimited foreign currencies?
Do your financial systems use a common set of currency exchange rates?

11. Can you link our executives' computers directly to the mainframe—so they can get their own information?
Is that software available right now?

12. How will you make sure our own people thoroughly understand your system?
Do you have educational centers near us, or will we have to travel all the way across the country to find one? Will you be there to help during installation and after?

13. How many of your people specialize in software for my industry?
How many accountants work for you? Human resource specialists? Manufacturing experts?

14. Do your systems have built-in features that make them easier to use?
What happens if someone needs help figuring out a feature? Do you have online documentation that's easy to understand?

15. As my business changes will your system be flexible enough to change with it?
Or will we have to pay a lot to revamp it? Or even regenerate it?

35,000 days of training

At MSA, we make sure your people have a firm grasp of our systems. Last year alone, we conducted more than 35,000 student days of customer training for over 1,800 companies. At education centers all over the world, as well as at our headquarters.

From training sessions to cassettes to complete, easy-to-understand documentation, MSA provides the most extensive Customer Education Programs in the industry.

And MSA systems are just as friendly as our people. Our online HELP feature actually guides users through our systems, and EASY-SCREEN™ lets them design their own screens without creating data processing nightmares.

If there's ever a question or problem with our systems, MSA customers are always close to service.

Our Account Managers are knowledgeable, responsive, and backed by a complete team of industry specialists.

The heart of our integrated systems

It's MSA's General Ledger System. Combined with Accounts Payable/Purchase Order Control and our other systems, it gives your company complete control over your financial information.

Over 800 data processing specialists, accountants, and financial experts work together to make MSA's financial systems the most advanced and most highly integrated in the industry.

MSA has the answers

Whatever your size—whatever your business—MSA has a total software solution.

We'll provide the highest quality integrated online software.

We'll tie your business and manufacturing software systems together, using our exclusive Extended Closed Loop™ manufacturing system.

We'll provide business software for your microcomputers, through our Peachtree Software Company.

We'll even link your microcomputers to your company's mainframe—with MSA's Executive Peachpak™ application software. A revolutionary concept that lets executives get the mainframe information they need through their personal computers.

MSA ready-to-install applications software
1. General Ledger
2. Accounts Payable/Purchase Order Control
3. Budgetary Control/Encumbrance
4. Fixed Assets Accounting
5. Capital Expenditure Tracking
6. Forecasting & Modeling
7. Accounts Receivable
8. Foreign Exchange
9. Inventory & Purchasing
10. Payroll
11. Personnel Management & Reporting
12. ALLTAX™ Taxing System
13. ALLTAX Reporter™
14. Manufacturing Control System (MRP II)
15. Executive Peachpak™
16. Peachtree Software™ business systems for microcomputers
17. Peachtree Software™ office productivity systems for microcomputers

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